THE AMERICAN GAS LIGHT JOURNAL

PUBLISHING OFFICE No. 42 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

VOLUME LXXXIV., No. 10. Whole No. 1,604. | NEW YORK, MONDAY, MARCH 5, 1906. | $3 PER ANNUM, IN ADVANCE.

A. M. CALLENDER & CO., Proprietors. C. E. SANDERSON, Manager. THOMAS J. CUNNINGHAM and ELBERT P. CALLENDER, Editors.

Published on each Monday of the year, at No. 42 Pine Street, New York.

Telephone.—2996 John.

Terms of Subscription, Including Postage.—For the United States and Canada, $3 per annum. European countries, $5 (£1—25 francs).

Remittances should be made either by post office order, express money order, registered letter, or bank draft on New York, payable to the order of A. M. Callender & Co.

Correspondence.—Wishing to make this JOURNAL a gazette of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, correspondence is solicited for publication from all who make the study of those subjects a pleasure or a profession.

The American News Company, Nos. 39 and 41 Chambers street, New York, are agents for this JOURNAL. Newsdealers will send orders to them. All payments to be made in advance. Single copies, 10 cents.

Books.—We will forward by express, at publisher's lowest rates, any book—scientific or otherwise—to any address in the United States or Canada. We would suggest to our patrons that to avoid the risk and expense consequent on sending us the money (we do not send books C. O. D.), that orders for books be sent us through the Purchasing Department of the American Express Company.

The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

OFFICIAL NOTICE—
Twenty second Annual Meeting, Ohio Gas Light Association 397

EDITORIALS—
Briefly Told 398
What are to be the Gas Rates for New York City?—Notes.
Address of the President of the New England Association of Gas Engineers (Mr. Frank S. Richardson, Williamstown, Mass.), on the Occasion of Its Thirty sixth Annual Meeting, etc. 398
Fifth Annual Meeting, Wisconsin Gas Association—Abstract of Proceedings 400
First Day, Morning Session—The Function of Advertising in the Gas Business by Mr. F. P. Kelsey—Discussion—Appointment of Special Committees—Respecting the Proposed Amalgamation of Associations—Noting the Death of Mr. G. C. Macmillan—First Day, Afternoon Session—Report of Committee on Nominations—Election of Officers—The President-elect Responds—Inaugural Address—Committee on President's Address—Extracts from a High Pressure Log, by Mr. H. M Cutcheon.
*"Why Gas Doesn't Burn," by "Observer" 406
*A French Gas Washer 407
The Position of Thoria 407
SPECIAL ENGLISH CORRESPONDENCE 408
Sales of Gas in Ireland—Tar Flooring—Death of the Governor of the Gas Light and Coke Company—Naphthaline Experiences.
ITEMS OF INTEREST FROM VARIOUS LOCALITIES 409
A Meeting—Contract for the Gas Machinery Company—"How Old is Weston, Mo.?" Hints from Tacoma, Wash.—Finished at Owensboro, Ky.—Is the Peoria (Ills.) Plant to be Sold?—Proposed Gas Plant for Iron Mountain, Mich.—Will Paulsboro, N. J., Have a Gas Plant?—Proposal—Personal—Cheaper Gas for Bay Shore, N. Y.—Hints from Middletown, Conn.—Supt. Mace is Not "Maced"—A Line or Two from *Engineering News*—And Other Items.
The Market for Gas Securities 411

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND-CLASS MATTER.

[OFFICIAL NOTICE.]

Twenty-second Annual Meeting, Ohio Gas Light Association.

OHIO GAS LIGHT ASSOCIATION,
OFFICE OF THE SECRETARY,
DELAWARE, O., Feb. 16, 1906.

The Twenty-second annual meeting of the Ohio Gas Light Association will be held at Cincinnati, O., March 21st, 22d and 23d.

The President, Mr. Donald McDonald, of Louisville, Ky., will call the meeting to order on Wednesday, March 21st, at 9:30 A.M., in Assembly Hall at the Grand Hotel, the headquarters.

The following will be presented at the meeting:

"Question Box," edited by Mr. Henry L. Doherty, New York City.

"Wrinkle Department," edited by Mr. W. E. Steinwedell, Cleveland, O.

"Novelty Advertising and New Business Methods Department," edited by Mr. George Williams, Madison, Wis.

"Progress Department," edited by Mr. Alfred E. Forstall, New York City.

"Information Bureau," edited by Mr. H. L. Olds, Lincoln, Ills.

"Bureau of Forms and Records," edited by Mr. D. W. Low, Alliance, O.

REPORTS OF COMMITTEES.

"Question Box Revision Board," by Dr. H. B. Harrop, Chairman, Milwaukee, Wis.

"Uniformity of Gas Meters," by Messrs. Chas. H. Dickey, Baltimore, Md.; Paul Doty, St. Paul, Minn; H. C. Abell, New York City.

"Flow of Gas in Pipes," by Messrs. J. D. Shattuck, Chester, Pa.; W. H. Hammon, Pittsburgh, Pa.; J. O. Johnston, Columbus, O.; H. A. Carpenter, Pittsburgh, Pa.

"Standard Sizes for Coke," by Mr. C. W. Andrews, Duluth, Minn.

"Standard Methods of Testing Fuel Gas Appliances," by Messrs. Henry L. Doherty, New York City; F. W. Stone, Ashtabula, O.; John Franklin, Cincinnati, O.

PAPERS.

"Compressing Gas," by Mr. William M. Welch, Columbus, O.

"Some Economic Relations Between Public Lighting Corporations and the Public," by Mr. W. H. Gardiner, Jr., Boston, Mass.

"Standard Methods of Construction and Operation of Coal Gas Benches—No. 3," by Mr. W. A. Biehr, St. Louis, Mo.

"Readiness to Serve Method of Selling Gas," by Mr. W. B. Tuttle, Long Branch, N. J.

"Producer Gas," by Mr. Henry I. Lea, Pittsburgh, Pa.

"Instructions to Gas Distribution Employees," by Mr. H. M. Robb, Peoria, Ills.

"Protection of Service Pipes," by Mr. R. C. Congdon, Atlanta, Ga.

An opportunity will be given any of the speakers at the meeting to correct their remarks before leaving Cincinnati, but not after, as all of the reports will be turned over to the printer immediately after the meeting.

The Grand Hotel is conducted on the American and European plans,

LIBRARY OF CONGRESS JAN 5 1906 SMITHSONIAN DEPOSIT.

and the following rates have been secured for the meeting: American plan, $3 to $10 per day; European plan, $1.50 to $7 per day.

The Grand has recently been entirely refurnished, and the management hope to entertain all of the Association and will put forth every effort to make the members comfortable. The most satisfactory quarters are always obtained by writing in advance to the hotel people.

The new 2-cent railroad rate in Ohio will be effective before the meeting so that transportation will be greatly reduced for all those who go to Cincinnati.

Although arrangements have not been entirely perfected, I am at this time, through the courtesy of Mr. James E. Stacey, Chairman of the Local Entertainment Committee, permitted to announce the following entertainment.

For the ladies, Wednesday afternoon: Special palace cars to Rookwood Pottery, Eden Park, Art Museum, and tea at the "Country Club."

Thursday afternoon: Special palace cars through Avondale to Norwood, visiting United States Playing Card Plant, Bullock Electric, Globe Wernicke and other large manufacturing plants.

Thursday evening: Theater.

For the gentlemen, Wednesday evening: Smoker at the Business Men's Club.

Thursday evening: Beefsteak Dinner in the cellar of one of the celebrated Cincinnati breweries, and such entertainment as usually goes with this feature.

The privileges of the Business Men's Club, which is but a few blocks from the hotel, will be extended to the membership.

The Secretary will furnish with pleasure application blanks for membership and any other information which may be desired relative to the meeting.

T. C. JONES, Secretary.

BRIEFLY TOLD.

WHAT ARE TO BE THE GAS RATES FOR NEW YORK CITY?—We are in a maze just now as to what the charges for gas in New York city are to be on and after certain dates that must be named, we presume, for the different districts or boroughs in due time. On February 23d the State Commission of Gas and Electricity handed down a decision that the maximum rate which must be charged for gas "of 22-candle power and of a purity and pressure now established by law," by the Consolidated Gas Company, shall be 80 cents per 1,000 cubic feet. This rate and ruling apply to all the subsidiary companies of the Consolidated, and is to become effective May 1st. In the meantime the Assembly passed a bill putting the price of gas at an equal rate to that named by the Commission, and that measure is now in the Senate. There are amendments and exceptions *in multum* to prices in certain districts and for certain times, and so it may be best to let the matter rest until the lawmakers know themselves exactly what they have done. So far, it can be safely said that their actions have not been characterized by sanity or sequence.

NOTES—

CAPTAIN F. C. DUNCAN has established himself in Princeton, Ills, where he is to manage the Princeton Gas Light Company, the purchase of which by the McKinley syndicate was recently reported in the JOURNAL.

THE Supreme Court, of Pennsylvania, has decided that the Consumers Gas Company cannot do business in Scranton, Pa., holding that the Scranton Gas and Water Company holds and enjoys an exclusive franchise until such time that it has paid 8 per cent. dividends for 5 consecutive years on its capital stock. The ruling is strictly in accordance with the provisions of the Company's charter from the State.

MR. JOSEPH M. RILEY has succeeded Mr. Herbert W. Moses as Manager of the local office of the Chelsea (Mass.) Gas Light Company.

SOME days ago a meeting of many interested in the distribution and sale of natural gas in the State of Missouri was held which resulted in the formation of a permanent organization. Mr. K. M. Mitchell, General Manager of the St. Joseph (Mo.) Gas Company, was elected President.

MR. J. F. LEWIS, of Lansing, Mich., has heen granted a franchies for the construction and operation of a gas works in Mason, Mich.

THE Union Supply Company, of Philadelphia, has been awarded the contract for the construction of the gas plant that is to be operated in Washington, N. J.

Address of the President of the New England Association of Gas Engineers' (Mr. Frank S. Richardson, Williamstown, Mass.) on the Occasion of Its Thirty-sixth Annual Meeting, Boston, February 20 and 21.

Naturally an address of this nature must present topics in the writer's mind; most writers of such papers are men of inquiring mind, leading sometimes more strongly to manufacturing details, other times to the commercial or financial side, and many times most clearly to every phase of the business. To anyone, then, the meetings of the various associations are both attractive and instructive to attend; instructive, at least, if the opportunity is afforded only to read the published proceedings.

Surely then do the presidents each year offer a reflex of what they care most to say, albeit the same subjects have appeared in various garbs, and more ably treated perhaps within the short period of 12 months. Yet is our business the old, old story, and man in his milder moods enjoys being told, and telling, some things already well known. So, were entirely new subjects only considered in the formal opening of such a gathering, or were a presiding officer to hesitate in stating his viewpoint of timely topics, this unusual first number would be changed in character and perhaps a small benefit to some one member lost.

The real worth of an association meeting lies not in the President's Address, which is referred to the usual committee for a customary report, but rather in the excellent papers contributed by the loyal working members and the discussion thereby provoked. Therein lies a duty incumbent upon all, for stronger and more strong grows my idea that upon the discharge of one's individual responsibility in taking an active and interested part in these proceedings depends the success of the meeting. The new and younger members bring a varied and welcome element into discussion; their modern methods may prove as valuable to the older men, pioneers of this profession, as is the latters' ripe experience to those just starting in the race for promotion and distinction. Make bold to dispute a statement if experience has taught you otherwise, and so assist those who have striven to make these gatherings of practical profit. Every member has some one thought which if expressed would be a direct assistance to at least one other member.

Assuming that every member present will endeavor to contribute in some degree to the success of these 2 days by taking part in the proceedings, and believing we shall not be disappointed in the smallest degree in that particular, it is my purpose to briefly treat a few features of our business apart from manufacturing, distribution or office system. Papers promise that some of those vital subjects will be ably presented, which will result in spirited and valued discussion. Changes in the social, political and financial world are forcing some questions home to the quasi-public corporations in a way unknown or not dreamed of a few years ago. The wise manager it is who now gives of his time and ability to a more careful consideration of the ethics of his profession, leaving many material matters to others for faithful furtherance. There are many weighty questions being presented to us calling for the best in good men and true to meet and solve in a spirit of equity, justice and right.

It is a trite statement to say that all communities are not alike; still it is a fact that most communities are just alike. A feature of the artificial lighting business possessing transcendent importance is the selling price. Whatever price is made the public soon expresses an opinion that a lower one could have been made, yet to the community's credit let it be said the criticism is most largely from those who either are very small consumers, or who never have business dealings with the company. The question is large and complicated; it cannot be considered from the same viewpoint by large and small companies, but the relative essentials are exactly the same, save in detail.

A system that apportions expense, so that every customer bears a just proportion of the total, is being widely considered and put in practice. It may be called meter rent, minimum charge, service charge, or known by any name; but its necessity and justice are apparent. Universality must be the result throughout the country. To illustrate how simple and how just it can be made to the public, I quote the notice sent by the Hartford City (Conn.) Gas Company, which reads as follows:

"*To Our Patrons:* Many people on our mains, though they do not use any appreciable quantity of gas, have installed in their residences or places of business meters which have to be periodically read, tested and cared for and regularly reported and recorded on our books. Each customer thus involves to the Company labor and bookkeeping charges

without in return adding to the increase of business of the Company. To cover such cases it has been decided that hereafter a monthly service charge of 50 cents will be made to customers who do not use 500 cubic feet of gas in any month. Where 500 cubic feet of gas or more is used no service charge will be made. This rule will appeal to the sense of justice of all, and will go into effect and be embodied in bills sent out March 1, 1905."

This concise statement carries conviction with its clear directness; its justice none can deny. A just placement of expense upon every customer makes possible a lower universal selling price. The system has much to commend its adoption; the public generally expect reduction in prices. A local company places itself in a stronger position to make all possible concessions unsolicited, and as often as possible.

The exhaustive and highly instructive report recently made to the Legislature of Massachusetts by the committee appointed to investigate the subject of a sliding scale, as governing in England, I commend to the most careful perusal of everyone. The question is large; its effect far reaching. The opinion and attitude of the press, the public and the companies themselves will be most interesting to note, I think, and sufficiently varied to suit the most critical. It is, nevertheless, one of the subjects in people's minds, with much of true argument to be claimed by each side whatever may be the fate of the report at the hands of the great and general court.

Were it possible to obtain a national standard of taxation for artificial lighting companies it would provide relief for some cases of positive injustice, place properties upon a more even basis and tend toward establishing more equal selling prices in communities where about the same relative conditions exist. In nothing is there a wider range of difference than in the local taxation of lighting properties, and the margin between the highest and lowest amount paid per 1,000 cubic feet sold, as indicated in the Massachusetts Commissioners' report, is startling. A petition has been presented to this session of the Legislature of Massachusetts for a franchise tax to be laid upon all quasi-public corporations in addition to all others now paid—others demand a certain tax upon gross income—but the provision in the law governing the price to be paid by cities and towns for artificial lighting properties acquired specifically prohibits any franchise value, and present or future earning capacity, being taken into account when estimating their value. It is here noticeable that the same point of view is not taken upon the two sides of this subject. This vexed question must, however, be met and endured, I fear, as of old, for many years to come.

There is to be presented to this meeting a report upon electrolysis, which, from the personnel of the committee appointed 2 years ago and the importance of the subject, will be not only exhaustive and instructive, but a model in perfect concise form. By that token, perhaps, advantage ought not to be taken by earlier mention being made of any details of the question, but personal experience compels this prelude to the report that the importance of the subject may be doubly emphasized.

This is a most serious condition gas companies of the country are facing. The menace is here; it is a reality; it works while you sleep; and the absence of any general law governing in the premises, or cases establishing real and equitable precedents, tends to make it a necessary duty for a concerted movement to be started testing the right of one corporation to operate and maintain a public service under legal authority, when in so doing it becomes not alone a nuisance but destructive to property and a menace to life. No person or persons have a right to maintain a nuisance, and it would be a reproach to our systems of jurisprudence, and the administration thereof, if a situation could arise in which large and material injury should be done to legal rights, and destruction caused to property, while the law was powerless to apply a remedy. It has been justly ruled that, "Where a corporation is exercising a public franchise, and does so in such a manner as to cause actual material injury to legal rights and destruction of property, when at a reasonable expense, by the adoption of well-known and approved appliances, the injury would be avoided, and the person injured is powerless to prevent or guard against such injury, then I think it must be held to be negligence in the use of its franchise on the part of such corporation not to adopt such approved appliances."

Therein lies the crux of the whole matter; nor do I believe we will be much longer called upon to sustain this irksome and unjust burden. If concerted action is not taken someone soon will independently claim his rights by invoking the law to know why trolley systems can be exempt from the relative responsibilities placed upon gas companies. I am one who believes that there is not the slightest doubt in fact or in law that full payment can be collected for damage caused by loss of electric current, and with the same certainty and reason as has been done from the effect of leaking gas. Cases are now pending in some courts; in other localities the trolley systems are paying promptly all damages done to gas pipes, thereby saving cost of litigation and so practising the tenets of the Golden Rule. There are companies, though, who with utter disregard to the rights of others ridicule the idea of any compensation being made, yet demand from their patrons and the public their full pound of flesh.

I make bold again to introduce the subject of municipal ownership, now running riot nearly everywhere, and because it forms the most pitiable, melancholy and lamentable evidence of political unrest and financial fanaticism the country has experienced for years. Coxey's army marching on to Washington, and Bryan's forces supporting free coinage of silver, are likened to the cries now going up for the wholesale adoption of this experiment. Nowhere is the movement favored, believed in or voted for by taxpayers. People whose property must be pledged to raise funds necessary for such undertakings never are found advocates of this dangerous experiment. It is a sad commentary upon American politics and local governments that it is possible for individuals, not interested financially, to ofttimes foist such an undertaking upon a town or city.

Misery loves company, though, and we shall have repeated examples presented in the future of public utilities being taken over for municipal operation, notwithstanding the wreck-strewn path already traveled, or the honest opinion of those best able to judge uttered in timely warning.

Reckless statements, the most fallacious arguments and unreliable conclusions are made, used and presented by people totally uninformed and wholly misinformed, and these at times are believed against the life work and ripe experience of honorable men. The operation of artificial lighting properties by municipalities has no more reason than that local governments shall carry on the liquor business or steam laundries—nor one-half so much. I am one who believes that no work of a public nature can be done so well or so economically as when carried on by private enterprise. Experience proves my statement, for cities and towns are paying large sums of money in excess of the necessary cost for their public work, and the government to-day, in the largest and most stupendous undertaking in the world's history, turns to private contractors to do the work upon the Panama Canal. The day is not far distant when private enterprise will offer to do, and will be allowed to do, all street and sewer work for cities and towns and at a saving that will make the taxpayer gasp. Existing political conditions compel this to be so, and evidences accumulate to show strong influences are making these facts only more strikingly apparent. Private corporations rigidly surrounded with proper State laws that are equally just will always best conserve and protect the true interests of both the public and the individual. Aside and apart from the score of reasons why any wholesale adoption of this fad would militate against the good and prosperity of the country and State, the practice has no place in America. Municipal ownership does not belong to, or fit in, our body politics. No comparison can be made to European countries, for it is essentially un-American, and one has but to read the opinion publicly expressed by Mr. Dalrymple, the expert brought over from Glasgow to view the Chicago city problem, to be convinced the conclusion I have expressed is shared in by one thoroughly well able to judge of this question. Do not conclude that materials and supplies cannot be purchased as reasonably by municipalities as by private interests, but after then the ways divide, nor can expenses fail of being inordinately higher so long as certain existing laws continue to govern city and town employees.

Bald as the statement may seem, the direct, intelligent and selfish personal interest in the undertaking, without the handicap of official inexperience, red tape and strife for re-election to political office, is the fundamental cause of the ability of private companies to be successful where municipal plants are failures.

A company's duty fully and faithfully discharged is the surest safeguard of public interests. In communities where such conditions obtain cities or towns should never acquire public utilities for operation and so rob themselves of such protection.

Very soon there will appear in print a report, written by E. W. Burdett, Esq., of Boston, of the committee visiting Europe to investigate municipal lighting. Mr. Burdett needs no introduction to you; no commendation from me. His clear insight, ripe experience and splendid judgment will be combined in making this the most valuable, interesting and convincing article ever publicly presented upon this important subject. I strongly urge every member securing a copy when printed, that it may be carefully studied and placed in the hands of supporters

of this movement, that they be shown the opposite side of the question presented in such lucid and forceful form.

Most potent is the influence of those guiding the daily doings of local companies, if their policy toward the consumer is conservative, generous and tempered with inexhaustible patience. Times have changed so wonderfully, and are still changing, that to lose step in the marching column is to be ordered out of the ranks. Our relations to and with the public are of paramount importance, the faithful discharge of which should be given as careful thought as the knotty and important questions arising in the realm of retort house, street mains or elsewhere. Each year the gas company fills a larger place in the community; the gas man each year ought to fill a larger and warmer place in the community's heart. Our business must be dignified by high ideals and true principles, that we may deserve and obtain the character and reputation so much desired, but which come only from concentrated effort.

There is wonderful truth in this saying: "We do not estimate at its true value the magnetic power of thought, which draws to us what we confidently seek, if we only fix the center of attraction and hold it steadily to its work."

There were four members of this Association who passed on from this activity since our last meeting:

George W. Farnum, of Lowell, Mass, February 5th.
Robert B. Taber, of Burlington, Vt., March 27th.
Dudley D. Tilton, of Newburyport, Mass., October 15th.
E. J. Hassett, of Beverly, Mass., August 7th.

They were all older members, not known perhaps to those who have recently joined the Association, but their ability, faithfulness and sterling characters are incentives to better work by those of us still remaining, and their genial friendships will ever serve as pleasant memories to those fortunate in having known them in active life.

FIFTH ANNUAL MEETING, WISCONSIN GAS ASSOCIATION.

HELD AT THE HOTEL PFISTER, MILWAUKEE, WIS., FEBRUARY 14–15, 1906.

FIRST DAY—MORNING SESSION.

The meeting was called to order by the President, Mr. E. G. Pratt, of Milwaukee, Wis., the morning of February 14th. The Secretary's desk was occupied by Mr. Henry H. Hyde, of Racine, Wis. After the regular routine business, which included reports from the Secretary-Treasurer, Executive Committee—their report was put over for later consideration—and the postponing of action on other regular matters, the President announced he would also defer the reading of his address until the afternoon session.

The President then introduced Mr. Fenton P. Kelsey, of Milwaukee, Wis., who read the following paper on

THE FUNCTION OF ADVERTISING IN THE GAS BUSINESS.

It's pretty hard to arouse any enthusiasm from the manager of a large business to-day when you approach him with a "brilliant idea." Forthwith he will ask you, "What will it get me?" and if you haven't pondered long and carefully over that very query yourself, it's up to you to do so immediately.

So, being interested in advertising from a cold-blooded business standpoint, we seek for the definition which will give us the clearest idea how to proceed. It has been defined as "Time or money expended in trying to increase our business, influencing our customers or the public, either by visual evidence, or by oral, written or printed arguments." It is further stated that advertising in the gas business is in a way "Simply indirect or direct solicitation, while solicitation may be direct solicitation or simply advertising."

Relation to Modern Organization.—Right here you see how the advertising must fit in with the organization of the modern gas company, with its well-equipped new business or commercial department. Its effect can be carried to a more complete consummation than where such an organization does not exist.

For instance, it is set forth as an axiom that an advertisement of whatever kind should do four things: First, attract attention; second, arouse interest; third, create desire; fourth, bring about resolve to buy. This is true of the article which, once sold, the seller has nothing more to do, save to wish to repeat the sale of the identical article. It is true, as far as it goes, with writing an advertisement for gas—only the organization above referred to permits of the effect, whatever it may be, being followed up more completely.

Suppose the prospect has a mind which is not logical enough to follow your "ad." through to the "resolve to buy" stage, or suppose your "ad." isn't sufficiently logical or strong enough to bring him there. Suppose you have only attracted attention or aroused interest. Your solicitor comes along. He already has an opening. He is more liable to get a hearing. He is still more liable to if you have so shaped your "ad." as to make that opening for him. We have then exploited our product to the extent at least of making an opening for the solicitor. What else are we striving to do?

Big, national advertisers spend lots of money for what they call "popularizing their goods"

Promotion of Goodwill.—With a gas company "popularity" is a part of the "goods." Without the goodwill of the public, energy, investment and brains are discounted many times over.

The feeling has existed for a good many years, as we are told, that a gas company, since it has had a monopoly during the whole of its existence, has known that the people must come to it and has acted accordingly. In our own case we know that the feeling does not exist. Be that as it may, we know only too well that a vast number of people, realizing or thinking at least that a commodity which they must have is under the control of one man, or one band of men, are inclined to think immediately that an advantage is being taken of them, simply because the opportunity of doing so seems to exist.

We are at one in the belief that that man or that band of men are in a position to attain the highest success, to just the extent that they succeed in impressing upon the people with whom they have to do that not only are they not taking advantage of conditions as they exist, but, because of these very conditions, the people are being benefited to a greater degree than by the existence of any other possible conditions. We are furnishing good gas at good pressure, of requisite candle power, plenty of heat units. Why not let the people know of these things and about every move which is made for the betterment of the service?

We all know that newspapers exist in our community, and that news comes from every part of the earth about the grasping methods of corporations, etc., and that they would be inclined to put their local company in a class with the rascals, real and alleged, unless they are acquainted with conditions as they exist. As has been stated, a gas company has a franchise that permits it to operate in one particular town; its distribution and transportation systems are applicable only to its own products. Its field is limited.

We can occupy our field wholly, or to only a limited extent, according to the manner in which we foster that field. By our advertising, rightly directed, sanely used, we can set agencies to work which will make us feel justified in continuing our methods year after year.

Has Double Function.—We have, then, a double function for gas advertising, exploitation of gas and gas appliances, chiefly as an introduction and aid to personal solicitation, and promotion of goodwill. Let us see how closely the two are interrelated.

When you put out any sort of tactful, straightforward, truthful argument, you are doing your company good. You are making people think: "Why, the gas company wants my business. They are actually asking for it." If a man is convinced that your company is on the square, if you have dissipated his prejudice, educated his ignorance, removed his misunderstanding of your deeds and your motives, your ideals, he is going to take stock in your statement when you tell him that you have the cheapest medium obtainable to light his home, cook his meals, melt his metal, turn the wheels in his factory. Having proven your statement by experiment, he is going to make use of your medium in every possible way, because he knows it saves him money.

Tell of Missionary Work.—For this reason, gas men realize that every act which raises the company in the consumer's mind, gives him better service, is the most valuable kind of advertising—for instance, burner maintenance, stove repairs, the proper following up of complaints, demonstrations, etc.

If you have a department for adjusting lamp and range burners, tell the consumer so—explain to him just how far, and how efficiently, you can assist him. Tell him in warm, convincing, unmistakable language. Tell him so again. Mention, of course, the sort of appliances that help most to give him the sort of light and heat and power he is looking for.

Because it is your gas he is burning, he is going to have confidence in your word. Your confidence in the appliances you have selected, after careful tests and long use, is going to be reflected to him. And it is in working for the business of this man, the present consumer, that we can occupy our field most fully. The reason is not far to find

because increased sales of this sort require no further investment in mains, services, meters, and connections.

To anticipate slightly a topic which will follow, I will say that the most efficient means we have found to reach our consumers have been the stickers on the gas bills, which are delivered by the meter readers, and which are accompanied by return post cards; this in spite of the fact that they go out every month to the same people. We find that the consumers will read our messages to them, and that they do believe what we say, simply because we have made good our words in actions. I might say that campaigns in this line have been self sustaining. Campaigns against consumers have been supplemented by various other means. The ways of getting at them are illustrated in the layout of advertisements which accompanies this paper.

What Media to Use.—Direct solicitation, everything else being equal, is, of course, the safest way to try to land business. The general manager of a company could, if he wished, stop every merchant he meets on the street, and try to interest him in the use of gas arcs. But he is paid to attend to matters of more vital importance to the company.

So the solicitation is delegated to other men. As the number of people increase whom the man who does the soliciting wishes to see, he uses the telephone. By-and-by he gets other men to help him. The number of prospects increase, and it becomes impossible for him, or his representatives, to appear before each in person as often as is desirable. So he sends each a letter, telling them his message as plainly and forcibly as possible. When the people he wants to reach get so many of this same sort of messages that they are liable to pay little attention to his, he takes advantage of the human characteristics of curiosity, love of color, etc., and sends them cards with which he hopes to attract attention, then arouse interest.

The number of people he wishes to reach grows, and he takes advantage of the organization of the modern newspaper, which reduces to the minimum the expense of preparing his message and getting it into the hands of the people.

Again, he takes advantage of the fact that people do not stay at home all the time. They go to business and pleasure on the streets, and by means of street cars. He sticks his message in big type before them on bill boards and street car cards. You see that all these have a logical place in getting the attention of the mind.

The question which each of you asks himself, and would ask the man who has had anything to do with advertising, is "Which of these media is best?"

It is not unusual in gatherings such as this for a dozen men to get to their feet at once, and when opportunity offers declare: "The newspaper be damned," or "Picture cards are a waste of good money," or "Letters go into the waste basket." Perhaps the experience of each of these men with the medium they anathematize has not been a profitable one, but perhaps they used it for the wrong purpose.

Does not a general solution present itself in the foregoing statement of the development of advertising—that is, to reach people about whom you have definite information, and to whom you know just what to say, if you can't do it personally, do it by letters; to reach somewhat larger classes about which you have less definite information, use these letters and mailing cards; to reach larger numbers, with a message less specific, and less pointedly directed to definite, limited needs, use the newspapers, bill boards, street car cards.

There is no denying that if you get it in such form and place that it will be read, newspaper advertising reaches more people more cheaply than any other means. For this reason, it probably offers the best means for valuing the worth of other forms of advertising. One man who has made quite a study of gas advertising says he uses the following formula of determining the worth of the other mediums as compared to the newspaper:

Number of issues x circulation x number of readers of each paper x number of units of space equals number of opportunities, and by dividing cost by number of opportunities you have cost per opportunity. By unit of space is meant the largest space in any particular kind of publication that can be read and appreciated at one time by the eye, as standing out against or as compared with the surrounding matter—the smaller the piece the smaller the unit space.

Use of Newspaper Space.—Now a little as to our experience in the use of newspaper space. The unusual always attracts your eye; so does the artistic. In the average newspaper, nearly all the "ads." are set up from newspaper type. For this reason, a design embracing lettering which will be entirely different from any found in the body of the paper is bound to catch the eye. Let this design have plenty of white and black effect, and it is going to stand out still more. Let it embrace an illustration of the object you are pushing, or at least let it typify it so strongly that the eye of the reader, as it travels hastily across the page, will fall upon it.

Suppose, having seen this object, his mind is arrested, and he reads your "ad." Suppose he merely catches the words, "Do it Right: Cook With Gas," or the word "Coke," or sees a striking illustration of a Humphrey gas arc lamp, or a gas engine, or a gas range, and doesn't stop to read. Suppose he opens up the paper the next day and sees the same thing, the next and the next. Some day he is going to stop and read your "ad." At any rate, he has coke or gas range on the brain, and when a cold snap comes, or when the sweetest girl in all the world says "Yes," these subconscious impressions are going to rise into consciousness.

Take the series of coke "ads.," for instance, which we have been running this winter. The word "coke" appeared in such form as to strike the reader above everything else that he saw on the page. A small coke pile, or a base burner, or a coke wagon, or some lumps of coke, were also represented in the "ads.," each of which gave the reader specific directions as to how to succeed with coke, as well as told some of its merits. But the best part of these "ads." is that they occupy only 4 inches of space.

Preparation of Copy.—A certain high-minded seriousness in your tone is going to make the impression you want to make on the mind of the man you want to reach, and the depth of its effect will be in exact ratio to the earnestness and straightforwardness of your presentation.

It is for this reason, I believe, that some of the best arguments on paper that you and I have seen have been prepared by hard-headed business men, directly in charge of their own business, who don't know a thing about what some people call the "science of advertising," who perhaps can't even spell correctly, but who are thoroughly acquainted with every phase of their own business; and, what is more important, the ones most vitally interested in the returns from money spent.

This does not mean that serious copy cannot be full of life. It does not mean that it cannot be short and crisp, that you cannot talk in a humorous vein, if this humorous vein is used immediately to press your point, and if the moral is not a far cry from the humor. Remember, however, that it is very costly to buy space or good looking paper, just for the sake of being funny, bright or original.

In newspaper advertising, as well as in other forms, I believe that a graphic representation of the appliance you are pushing is the best method. If possible show it in action; a demonstrator cooking a meal; a man taking a bath (handle with care, however); a fixture equipped with the lamps you recommend. We find that reproductions from photographs are the most successful.

Work from Prospect Lists.—The Milwaukee Gas Light Company works from picked prospect lists, figuring that it pays to expend enough money to have definite information at hand for the use of the solicitor and for advertising purposes, and to employ a sufficient number of people to keep this record accurate and up to-date. You are sure then that every letter or circular sent out is reaching the person you wish it to reach and is doing the maximum of good. Personal or circular letters have proven the best business getters in this case.

In sending letters it seems to be the best plan, if you have a process which will give you letters which can't be told from typewritten ones, to inclose letters to nearly every class under a 2-cent stamp, increasing the chance of its being read at least 100 per cent., as against using a 1-cent stamp. The tone of your letter must be suited to the prospect. There is the busy man who will not read a long argument, the person to whom you will have to explain the first thing about your proposition, and who gets very few letters; the misinformed or prejudiced man or woman; the people who only need to be told about a new offer before they will close with you. Inclose a return post card in every letter, asking for a call by a representative. Such cards when returned rarely fail to be productive of closing a sale. The sending of a letter should be followed within a week or 10 days at the outside by a call from a solicitor, whether there has been a response or not. The letters should be as near personal solicitation as possible in form.

Personality as Affecting Public Goodwill.—Have you ever thought how much the personality of the man whose thoughts and ways of thinking are read by the thousands of consumers has to do with the attitude of the public toward your company? Mr. Frederick Coburn, writing in *Public Opinion* of the causes of the popularity of the "Boston Elevated," says: "Corporations may or may not have souls, but they have personalities, and very distinct personalities. The Boston Elevated Company, in its 8 years of existence, has somehow impressed itself upon the inhabitants of Eastern Massachusetts, somewhat as an individual impresses himself by trying to be square in his dealings

with everybody, to be energetic and businesslike, and withal to keep his sense of humor."

He explains how this personality is worked out in good service, courteous treatment by employees, and by the attitude toward the press. Too much care cannot be expended in the written message which goes forth as the exponent of this policy. Let it be in comely dress, let it be urgent in its appeal, yet let it not lack in dignity, for in losing dignity it loses force. Above all, let it be earnest and straightforward, having the ring of truth, and you will get the public ear.

Discussion.

The President—You have heard Mr. Kelsey's paper. I would like to have it fully discussed. Will Mr. MacAdam start the discussion with some of his enthusiasm?

Mr. MacAdam—I am afraid that the applause Mr. Kelsey received bodes ill for me, because my argument is going to be on the other side. While the principles of this paper are in the right direction, some parts of it in my opinion deserve criticism. On page 18, under the title of "Promotion of Goodwill," Mr. Kelsey says, "With the gas company popularity is a part of the goods. Without the goodwill of the public, energy, investment and brains are discounted many times over." I challenge such a statement, for in such cases brains cannot be discounted. No gas company can become popular or get the goodwill of the public, unless there are brains of sufficient caliber to bring about such a result. Popularity and goodwill are not the result of advertising by any means—far from it. On page 19, Mr. Kelsey again mentions goodwill under the heading, "Has Double Function." Now, read carefully: "Tactful, straightforward, truthful argument." How strange that seems, when he says at the beginning of his paper that it is "Advertising from a cold-blooded standpoint." He contradicts himself right there. (Laughter.) And in his closing sentence, on page 25, he says, "Above all, let it be earnest, straightforward, having the ring of truth, and you will get the public ear." It must only have the "ring of truth," understand. That means it can be anything you please, if it only looks like the real stuff (laughter) and can it be otherwise from a cold blooded standpoint? We are gifted with too much good sense to take Mr. Kelsey's statement in this regard at par, and when he has attended a few more such meetings he will find much independent thinking among gas men on these points, and if they think that picture cards are a waste of money they will say so, and if they don't want to damn the newspapers why they won't do it, and it is their privilege to say so, because everyone is entitled to his opinion. On page 24, under the head of "Personality as Affecting Public Goodwill," I think his sentiments are the hardest yet expressed. Just imagine Mr. Kelsey or any other advertising manager converting 300,000 people to his way of thinking—a little god by himself—putting words into the mouths of babes—imagine the personality of one man, in the most degrading position in the business in my estimation, "cold-blooded advertising," swaying public opinion—the personality of one man or a dozen men will be of no avail, if you don't put up the goods. The personality of the man at the complaint window is worth a thousand advertising managers. If the announcement was made tomorrow that gas in Milwaukee would be sold at 75 cents per 1,000, personality would then not amount to a rap. Your popularity would be on the increase and you would have a cinch on the public goodwill. No one can dispute the advantage of advertising, but money should be spent judiciously and not squandered, as is often the case in fostering "personality."

Mr. Kelsey—Mr. MacAdam's attitude and remarks remindme of some of the experiences of my boyhood. Occasionally, on a nice summer afternoon, when the air was balmy and the schoolroom seemed very close, I used to start on my way to school, often kissing my mother good-bye, and when I would get down the street a little ways I would take a detour, and perhaps find my way out to a large, open space, where there were several acres of flowing canvas, and sometimes I had a quarter in my pocket to get in, and sometimes not. If I did not I would watch until the man at the edge of the tent was looking the other way, and then I would crawl under the canvas; but if I had a quarter I would bribe the keeper to get in for 15 cents and then have 10 cents for lemonade and peanuts. The remarks of the last speaker remind me that one of the most enjoyable spectacles there was to see a man in very gaudy array, with pink cheeks and white nose, a cap that extended almost to the ceiling, come out with a whoop and a hurrah; and we used to enjoy that as much as anything; and it was always near the beginning of the performance, too. Of course, the only thing is that he didn't have his little "spiel" down on a piece of paper; that is the only difference. (Laughter.) Now, in connection with the Milwaukee Gas Light Company, we appreciate Mr. MacAdam's standpoint. It is always good to have a little fun, and you know that he did not mean to intimate that the advertising man was a little tin god—he did not say on wheels—but you may have thought the wheels were up here in the advertising man's head; but there are one or two things that I want to call to Mr. McAdam's attention in connection with the paper. This business of personality did not refer to Mr. Kelsey and the menial position which he occupies with the Gas Light Company; but have you ever thought how much the personality of the man whose thoughts are read by thousands of consumers has to do with the attitude of the public towards your company? I may say that the messages going out from the Milwaukee Gas Light Company are not sent out just according to the whims of the man who has to write the advertising by any means. One of the campaigns we have been carrying on most recently has been the burner maintenance proposition. For 3 months consecutively we have sent out stickers on our gas bills, calling the attention of people to conditions that might exist in their homes as to lighting, and telling them if conditions were not right it was their own fault practically, because we had a corps of trained men who were ready to help them just for the asking, and that message was pretty carefully gone over. If Mr. McAdam could have been present at some of the sessions had, at which Mr. Rutledge, Mr. Haase, Mr. Pratt and I were present, and knew some of the criticisms to which the advertising department had been subjected, and how the course for them to pursue had been outlined after careful consideration, he would not take the position which he now does; but he would see that it was the personality of the Milwaukee Gas Light Company, and not of one man, that went out to the people, and no gas man in this room would object to that; and I think that he would heartily commend the efforts and the results made and obtained by this method. For instance, we first sent out a return card 3 months ago, and immediately began getting them back at the rate of 30 a day. We sent the same message next month with the same result. We sent the same message out for a third time last Friday, and Saturday we got 39 returns. People now believe what the Milwaukee Gas Light Company says to them, not because of the personality of any one man, but because of the personality of the Company, and because it tells the people what it is ready to do and does what it says it will. That is the secret of it.

The President—There is nothing that adds so much to a valuable paper as a good, lively discussion. It does me good to see how this one has been started.

Mr. Walker—I believe that the value of advertising to a gas company is certainly a very important point, whether the gas company is large or small. I do believe, however, that there is no company which can lay down rules for advertising which are entirely applicable to every other company. All parts of the business, whatever they may be, are governed by circumstances and conditions which arise in the different cities where gas is used, according to the class of people which they have, their nationality to a certain extent, the conditions which surround and the price of fuel or the price of other illuminating sources; but as a general proposition I do not think that there is any question of the value of good advertising for each and every company in the country. As I said before, I think the quality and the proper distribution of it must be entirely guided by the conditions I have mentioned.

Mr. Wortendyke—I only wish to add to what Mr. Kelsey stated, where he says it is the right thing in gas advertising, to so put your subject before the people that a most cursory glance at the advertising medium will impress upon the mind of the reader the point which you have to bring out. Very many advertisers in papers, realizing that newspaper space is very valuable, write it full, and you have to read the advertisement very carefully to find out what it covers; but I think newspaper space can be used more advantageously by employing very few words, and those standing out very plainly, than in any other way. Do your talking by solicitor or make full explanation by letter afterwards, but bring out the single vital point in your advertising medium, if it is a newspaper.

The President—One thing I would like to impress upon you gentlemen is not to be at all backward in discussing these questions that come up. We all belong to the same family and there is no reason why we should hesitate in the discussion of these matters.

Mr. Kimball—The first difficulty that I have had is in determining how much we could profitably afford to spend in newspaper advertising; and the next difficulty is whether it is better to carry the same amount of space and spread it over a whole year, or take it at specific times when your market for stoves, illuminating sales, etc., whichever it may be, is the best. We have found results to be better in Kenosha

when we do not carry a certain amount of space all the year around, but carry a larger amount of space at the time we can sell stoves, do illuminating work, etc. I think the average small plant at any rate neglects the advertising proposition and neglects the changing of copy, on account of the fact that it does not have a man whose entire business is to look after the advertising—that is one of the weaknesses in our plant—that this advertising proposition is neglected, where it should not be.

Mr. Rutledge—I think it is pretty hard to determine just where the profit from advertising comes in, from a "cold-blooded" standpoint. It is hard to see any money coming in from advertising when you spend it. I think the effect is cumulative. It is far-reaching in its results, and you are going to reap the benefit of that work in the future rather than at the present. I think it is almost impossible to gauge it at the time that the money is expended. However, one point that Mr. Kimball brought out I consider important. I do not know I agree with him exactly that the proper way to handle advertising is to come out with a splurge for a certain length of time and then quit. I think that the gas company has a good commodity. I think our field is so broad that we always have something to talk about in the gas business, and if we are constantly holding our commodity up before the people, we are putting the people in a receptive frame of mind, and when we approach them they know something about your product. It is pretty hard to approach a man and do all the talking yourself. It is a great deal easier work for you if your prospective customer knows something about the subject before you get there, and I believe that rather than to come out, as Mr. Kimball suggests, at any given time in the year, and then stop advertising abruptly; if you will continue the advertising throughout the year, and get the people to thinking of gas at all times, they will turn their attention toward you at any time when they have any use for the commodity which you have for sale. One other point was brought up in the discussion in regard to advertising. I do not believe it is possible to advertise any product when the product itself is no good and succeed in selling it. I do not believe it is possible to sell advantageously good product of the kind that we make, unless the people know how to handle it; and I believe it is just as necessary to educate the people up to the use of our product as it is to manufacture the good product itself. I think they are equally valuable, and for that reason I think it is up to the plant to produce the best product possible, and it is up to the business department to see that people know how to use the product after they get it.

Mr. Johnson—As for advertising, I think it has been proven that if it was even impossible to sell any more stoves, it would still pay to do a certain amount of advertising, as it keeps increasing the consumption on the meter. That educates the people to the greater use of the gas, and there is a question as to how much advertising it would pay to keep up, without any prospects of future sales; but there is never a time when your prospects run ont. As to the best method of advertising, whether by newspaper, cards or whatever else, I think it will depend a great deal upon the circulation of the paper and the number of papers in town. At Madison we have been doing a great deal of newspaper advertising. We do not have any set place in the paper or any particular size, but we run the advertisement the year around. Never a day goes but that our advertisements can be found in both the daily papers, and we have found that that alone certainly sells a great number of them. At the same time it makes it far easier for any solicitor to do his work, and the people who have gas stoves seem to have a far better opinion of the gas company, and it shows that the company is trying to do what is right. As for the return system, that is certainly a very good method when you are going after a particular object—for instance, gas lighting or anything like that; but in general I should think that the newspaper really appeals to the larger class.

Mr. Patten—We believe in giving good service to the people of Manitowoc, in the first place, and think it is a pretty good advertisement. We have used the return postal card, such as the Milwaukee Gas Light Company uses, in connection with complaints, and found it satisfactory. We run 6 inch "ads." in each of the daily papers of our city, and change them at regular intervals. In the spring of the year, just before the season opens up, we get out a lot of dodgers, booklets and circulars pertaining to gas and have them distributed, and this brings our proposition before the people. When they become interested we send our solicitor out after the business.

Mr. Haase—It is apparent to me from the discussion thus far that the companies represented here quite generally recognize that it is our business to do more than sell gas, but rather to furnish a service, and that service being of the commodities that generate light and heat. Now light is applied in so great a variety of ways, and heat also, that the nature of our service becomes a very complicated one. The companies represented thus far have expressed themselves as desirous of furnishing good service. If that service extends to furnishing light and heat properly applied it covers a much wider range of activity than is represented by the manufacturing and distribution department of the ordinary gas company. And, assuming that the manufacture and distribution of gas have been successfully accomplished, it yet may be a long way from giving the good service that I have spoken about, and the subject being as complicated as it is would seem to require calling to the attention of the public frequently, and in a variety of ways, what our intentions are and what our business is, that the people may come to us and ask us to furnish that which we are prepared to furnish. If a company is in a position to distribute a good gas of proper heating value and of uniform and unvarying pressure, it has yet the duty before it of advising people of its intention to take care of things beyond that, and the things beyond are quite complicated. We must always bear in mind that our customers cannot be expected to know about them. And the progress that is being made in the art, in appliances and the maintenance of them, are things they cannot keep pace with and require a continued campaign of education. I quite agree with Mr. Kelsey that the personality of a gas company is to a very large extent that which is made by the man who does the advertising. Now, we all know that through the advertising man speaks not only the general manager but the various men all down the line. We all know that the advertising man has his consultations and his talks with not only the heads of departments but with the men themselves, and when the advertising man speaks, if he speaks rightly, he is speaking for the company.

Mr. H. H. Scott—I have been interested in the subject, and think the question as to whether advertising pays is to be determined by each and everyone in a simple way. Let them take Brown's "Directory" and look over the list of gas companies in this country and learn the amount of gas sold per capita in different places, and get copies of newspapers in several cities, and they will find to their entire satisfaction that the companies that advertise are selling the gas. Mr. Williams told me that he is editing a book for the Ohio gas convention, entitled "Novel Methods of Advertising," and in his investigation he found it a striking fact that the companies that do the up-to-date advertising, and follow it up to the people who are using the gas, are the ones that meet with the greatest success.

Mr. Luebkemann—I think nothing has been said about the advertising of coke, which I consider a matter of prime importance. I got out 2,000 circulars some little time ago and sent them to the farmers within a radius of 16 miles from Eau Claire, and in 2 weeks we had at least 50 of them coming to us for it, and found the results of our advertising very good.

Mr. Walker—Speaking of the relative value of different kinds of advertising to the gas company, I might illustrate the point by an incident which occurred in my career about 15 or 16 years ago, when the Milwaukee Gas Company first allowed me, under pressure, to do a little advertising. It was not really considered dignified then to do any, but I had to do some because we had started in the gas range business, and that was the first chance there was to do any at all. I started out in the gas range business with the idea that the gas range to some extent was to be a luxury to commence with, and we would get our trade from the more well-to-do people. I commenced by sending our circulars with the gas bills every month. I very soon found that the people who came in to look after the gas ranges and saw what they looked like were of the middle, perhaps the poorer class of people. I received but very few calls from those whom I thought had money enough to buy, and soon found I was getting orders from the class of people who did come in. One form of advertising that I did use in the newspapers was simply the insertion of a few short line locals interspersed through the reading matter, and I found I could safely say that within 30 days after I commenced I had at least 100 people come in the office and mention that they had seen those small locals. Some of them even had them cut out and in their pockets. I was after the other class of trade to a large extent, however, and I thought I would get out something a little out of the ordinary, to try to catch it—a little more high toned. I had some nice cards printed up in wedding invitation style, sent them out in good shape, addressing them to all the names I could find in the blue book—it was the bluest thing we had there at that time. Out of 1,500 copies sent out I received definite mention from two. One was an old lady who came down in her carriage; she was beyond the age of doing any cooking, and was not going to enjoy it very long either. I think she understood there was to be a reception there, and she made a mistake. (Laughter.) The other reply came from an old

gentleman whom I had known a great many years before, and whom I had not seen for quite a while, and by receiving that card he heard I was in town. He called on me and said he had no earthly use for the gas range, but wanted to see me. (Laughter.) The difference in value of those two classes of advertising can be readily seen.

Mr. Kelsey—One thing that occurred to me as Mr. Walker was speaking was this matter of direct and immediate returns. Of course, that is what puts any sort of advertising to the bad. If you expect to have so many dollars and cents coming in within a certain time as a result of a certain effort you will usually be disappointed; but advertising is not for sentiment; it is to produce results. However, you have to take into consideration the fact that a lot of this stuff is not going to have effect to morrow or the next day. For instance, we are getting back return postal cards that we sent out last year. Of course, you have got to have a certain amount of space. You might say that that is an easy way for an advertising man to side-step—but I think the logic of the situation is correct.

The President—Mr. Kelsey has the thanks of the Association for his very able paper. I will appoint as the

COMMITTEE ON NOMINATIONS

Messrs. Ewald Haase, A. B. Eaton and H. M. Buck. As the

COMMITTEE ON NEXT PLACE OF MEETING

I will name Messrs. R. N. Kimball, B. D. Viles and I. F. Wortendyke. As the

COMMITTEE ON RESOLUTIONS

I will appoint Messrs. John Corscot, David Douglas and Ewald Haase.

The Secretary then resumed the report of the Executive Committee, taking up the subject of amalgamation, presenting a copy of the proposed constitution of the American Gas Institute.

The President—This matter has been under discussion for the last two years, and I do not think it is necessary to read the proposed constitution.

The Secretary—The report of the Committee on this subject and its recommendations are as follows:

We heartily concur in the recommendation of the Committees appointed by the Congress of American Gas Associations to formulate plans for the amalgamation of various gas associations, and recommend that this Association advises the Secretary of the Committee having this work in hand that it is willing to co operate with the other Associations along the lines laid down by the proposed constitution for the government of the national body.

EDWARD G. PRATT,
C. H. WILLIAMS,
HENRY H. HYDE, } Committee.

The President—Is there any gentleman here who does not understand what is contemplated? This Association, as you remember, had a representation in the committees appointed from other Associations which met in New York about a year ago, and this Association was represented by Mr. Hyde and Mr. Cowdery, and I have no doubt they performed their work on the Committee; therefore, as representing the Association, well. The plan, as you will observe is that it contemplates the consolidation of the three larger Associations of this country, the American, the Ohio and the Western Association, and that the State organizations hereafter will be subsidiary to that National Association, whatever its name may be; and the question is whether this Association favors the work as mapped out by the Committee.

Mr. Patten—I move that the report of the Executive Committee be adopted and placed on file. [Seconded and carried.]

The President—I wish to call your attention to the great loss that this Association has sustained in the death of Mr. George D. MacMillan, of LaCrosse, who was taken away from us Monday morning. The purpose of appointing a committee on resolutions was largely that they might report a proper resolution in his memory. I have myself prepared a short account of his life, which I will present to the committee for their use if they so desire.

A recess was ordered until 2 o'clock P.M.

FIRST DAY—AFTERNOON SESSION.

The meeting was called to order pursuant to the recess resolution. The President called for the

REPORT OF THE COMMITTEE ON NOMINATIONS,

which was read by Mr. Ewald Haase as follows:

The Committee on Nominations respectfully submit the names of the following gentlemen for election to the various offices of the Association for the ensuing year.

For President—Mr. John Corscot, Madison, Wis.
" *Vice-President*—Mr. Edward M. Daniell, Menominee, Mich.
" *Secy. and Treas.*—Mr. Henry H. Hyde, Racine, Wis.

E. HAASE,
H. M. BUCK,
A. B. EATON, } Committee.

On motion it was unanimously carried that the rules be suspended and that the Secretary be instructed to cast the ballot of the Association for the nominees for their respective offices for the ensuing year. [So done.]

The President—Mr. Corscot, I have to inform you that you have been elected President of this Association for the ensuing year. (Great applause.)

Mr. Corscot—Mr. President and Gentlemen of the Wisconsin Gas Association: I thank you very much for the honor that you have intended to confer upon me by electing me to this position, but I feel that so many other members of the Association have been in the gas business longer than I have, and that know more about it than I do, and who would be able to give it more intelligent attention than I can, that I respectfully request you allow me to decline the honor.

The President—But you have been elected. It is pretty hard to decline now.

Mr. Corscot—I would very much prefer if someone else would occupy the position. Some younger man it seems to me ought to be at the head of the institution, one who can give it more enthusiastic attention than I should perhaps be able to. I think it takes a great deal of time, and I feel I can scarcely afford to accept the election.

The President—You can put all the time to it you want. I suggest that the matter be allowed to rest until to-morrow morning possibly, to give Mr. Corscot an opportunity to think it over. Probably it is a little too soon, and I will ask you to assume the chair while I read what I have to say. (Great laughter and applause.)

President-elect Corscot took the chair, and President Pratt read his

INAUGURAL ADDRESS,

prefacing it as follows:

I have prepared here a very brief and, you will probably think, a very disjointed address. The subjects are so well covered by the numerous Associations that convene from time to time, that I thought in the preparation of what little I have to say, I should confine myself as closely to Wisconsin matters as possible, because I feel that this is a Wisconsin Association, and that we should first attend to the things which most directly affect our interests.

[For the text of President Pratt's Address, see JOURNAL, Feb. 26, p. 362.]

COMMITTEE ON PRESIDENT'S ADDRESS.

President-elect Corscot appointed Messrs. I. F. Wortendyke, John A. Patten and Edward M. Daniell a Committee to consider the President's Address, with instructions to report their findings later on.

The President then introduced Mr. M. H. Cutcheon, who read his paper giving

EXTRACTS FROM A HIGH PRESSURE LOG,

prefacing it as follows: I (pointing to a map of the Fox River Valley) appreciate that you will not be able to see this map from the back of the room, but I did not have time to enlarge it, so I thought I would tack it up anyway. This is supposed to be the town of Appleton, this is the town of Menasha, and this is the town of Neenah. This is the Fox River passing through the towns of Appleton, Menasha and Neenah. This is Lake Winnebago. The distance from Appleton to Menasha is 6 miles, the distance from Appleton to Neenah is 7 miles. The interurban electric road runs north and south from Appleton to Lake Winnebago and along the shore of Lake Winnebago to the Fox River, and along the Fox River Valley to the Government Canal, and across through Neenah is the pipe line which I will describe in this paper, which pipe line follows the wagon road.

From our gas works in Appleton to our regulator station in Menasha is a distance of 6 miles. The Neenah regulator station is a mile beyond, making the total length of our high pressure system 7 miles.

Our pipe line is 4-inch steel, laid at an average depth of 3½ feet. It crosses the Fox River on 3 bridges and under the government canal, within half a mile from the gas works at Appleton. It crosses the same river again on one bridge and under the same canal, at Menasha. The line meets our interurban electric road within 500 feet from the works in Appleton, at the first bridge, and parallels it across the bridges and canal and leaves it about half a mile beyond the canal.

Our street railway power house is located on this canal about a quarter of a mile up stream. After leaving the interurban road, the line follows the wagon road, bearing off in the same general direction as the electric line and meeting it again in Menasha, just before crossing the canal. Here it parallels the electric railway again for about half a mile and to within a block of the Neenah regulator station.

The pipe line was laid during the summer of 1901, and put into service in June, 1902. At that time all fittings on the line were flanged cast iron with paper gaskets. Flanged, cast iron drip-pots were set in the line at all natural drip points, the same as on any low pressure line. At this time we were using the line to feed our holder at Neenah, the distribution system in Neenah and Menasha being entirely low pressure. This holder was also feeding two 125-horse power and one 50-horse power gas engines in our electric station alongside the holder. We used an 8-inch Root's exhauster of the so-called high pressure type at the Appleton works for pumping to Neenah. This exhauster at normal speed delivered 4,500 cubic feet per hour at the Neenah holder against an initial pressure of 3 pounds. The output from the Neenah holder outgrew this exhauster in less than a year after starting it, and upon consulting Mr. George Goodnow, of Waukegan, we decided to adopt a 30-pound system similar to that he was using between Waukegan and Highland Park, Ills.

During the spring of 1903 we installed two 8-inch by 10-inch by 12-inch straight line compressors at the Appleton works. We used these machines for pumping direct into the Neenah holder until the following fall. One compressor delivered ordinarily 10,000 cubic feet per hour at the holder against an initial pressure of 7½ pounds. It was December before we got our station regulators into commission. During November we found it necessary to boost the pressure on our low pressure feeder between the Neenah holder and Menasha. We did this by connecting a 1-inch by-pass with globe valve between the high and low pressure mains where they ran side by side under the bridge between the two towns. By closing the Neenah holder inlet valve, and keeping about 10 pounds pressure on the pumping line, we had no trouble in maintaining any pressure we desired on the low pressure feeder by watching a siphon gauge connected to that main and placed before the man operating the 1-inch valve. Two 3-inch by 4-inch station regulators of the Johnson-Reynolds type were set, one at the Neenah holder station and one near the center of distribution of Menasha. As soon as these were working we cut off the Neenah holder from the high pressure line, excepting for a 1-inch connection with valve, through which the engineer of the electric station filled the holder once a day for supplying the gas engines. From that time on we carried from 10 to 30 pounds on the high pressure line.

In October, 1904, the Neenah electric station was shut down permanently and the electric load taken over by the Appleton power house. When this was done we put the holder out of commission and have not used it since.

During the winter of 1902–3, while pumping with the exhauster, we were troubled with ice forming in the line on the bridges at Appleton. At the time we had no way of removing the moisture from the gas pumped, and consequently it was thrown down in the cold bridge pipe. We did not even have a pulsation tank on the line at this time.

The following spring we installed a separator of the vacuum oil type at a point in the line about 500 feet from the compressors. This was sold to us on a guarantee to remove all moisture from the gas, but in reality it removed only about one-half, the balance being thrown down in the drips beyond the bridges.

We had one or two freezeups on the bridges during the following winter of 1903–4, but came through with no serious trouble, although on one occasion we had only 3,000 feet of gas in the Neenah holder after getting the line clear.

The following fall we replaced the old separator with a tank 6 feet long by 30 inches diameter, fitted with baffle plates, staggered similarly to the one used by Mr. Goodnow at Waukegan. After this we had no more trouble with moisture until early in the present winter, when we found that the sendout on the line had grown beyond the capacity of the new separator and considerable condensation was forming in the bridge pipe again. Early last month we installed a new tank without baffle plates at a point between the first and second bridges in the water power canal bank. It was at this point that the water had been bothering us by carrying over into a high pressure service and putting the service regulators out of action as fast as we could change them. Upon digging up the main here we found it trapped about 2 feet. We cut this trap out of the line and set the new tank in its place. The tank measured 8 feet in length and 3 feet in diameter, with 4-inch flanges on top of the shell and a 1-inch blowoff connection on the bottom. It was set below the line and connected with short 4-inch risers. During the recent zero spell we did not get a sign of moisture in the troublesome service. Apparently no moisture gets beyond the tank, for we get none from the drips beyond and certainly no condensation remains in the line ahead of the tank, or it would show at the blowoffs on the first bridge. Evidently all moisture passing the first separator and condensing on the first bridge is thrown over into the new tank before it can freeze.

I failed to mention that during last November we installed a pressure tank in the line just ahead of the Neenah regulator as a reserve storage, in case we had to cut the line at the Neenah-Menasha end for repairs. This tank measures 30 feet in length by 8 feet in diameter.

The shell is $\frac{5}{16}$-inch steel, and the dished heads a trifle heavier. It is set horizontally on brick piers about 18 inches above the ground. At 30 pounds pressure it holds approximately 4,500 cubic feet, of which 3,000 cubic feet is available. Since the installation of this tank we have been able to do several repair jobs requiring the cutting of the line for 3 and 4 hours at a time, without interfering with the service either in Neenah-Menasha or in Appleton, where that section of the town through which the line passes is supplied entirely from this line on a strictly high pressure system. This system we put in during the past summer and consists of 2-inch mains leading from the 4-inch line to Neenah, with 1¼-inch branches on cross streets. All services from these mains are ¾-inch, laid at a depth of from 2½ feet at the main to 18 inches at the house. The service regulators are of the Johnson-Reynolds type, with mercury safety seals. We set a full, round-way cock at the curb with outside thread on top to take the Peerless watertight curb box. This part of our system has never given us a minute's trouble with the exception of the one service before mentioned on the bridge. The first trouble we had from electrolysis was in the summer of 1902, one year after the line was laid. We found the riser from the drip in the canal at Appleton pretty well eaten away just above the pot, where it lay in the mud. As I have said before the street railway power house is located on this canal about ¼ mile from this point. The natural course for the street railway current returning from Neenah on the high pressure main would be to leave the main at this canal and take the easiest course back to the power house along the wet canal bank.

During the following spring of 1903 we discovered a considerable leak in the same canal. Upon drawing the water from this level, and examining the line through the canal, we found several of the fittings leaking at the flanges. The bolts in many cases were so badly eaten that they could be turned with the fingers. I ascribed this action to the paper gaskets acting as insulators. We stopped the leaks on this line and laid a new line through the canal connected as a by-pass to the old one. The new line was made up with Dresser fittings, but not of the insulating type. During the following summer we set 9 new valves in the line, one on each side of the government canal at Appleton and at Menasha, the remaining 5 being set between these points at a distance of about 1 mile apart. At each valve we use a Dresser insulating coupling in place of a union and connected a ¾-inch pressure test pipe, which was carried across the gutter to high ground, with a stopcock on the riser about 12 inches above ground. Alongside each of these risers a piece of 2-inch pipe was driven as a mark. These marks stand 3 feet above ground and are painted black. We set similar marks at each drip along the line and painted them red. The Dresser insulating couplings were used upon the advice of good high pressure authorities.

In the fall of this year a bad leak developed at a drip about ¾ mile from the Appleton canal on the Neenah side. We found the first length of pipe on the Neenah side of the drip badly eaten away in many spots, and one hole about ¼-inch in diameter clean through. We took out the drip and the affected pipe, replacing them with new pipe and a Dresser coupling. A blowoff was connected to the new pipe. This electrolysis was undoubtedly due to the paper gaskets used on the drip flanges causing the return current to jump around the pot on its way back to the power house.

During the zero weather, December, 1904, an elbow on the line crossing the bridge at Appleton broke at about 5 o'clock in the evening. There was an expansion joint within 200 feet of this fitting, but evidently the line was in some way held solid to the I-beams of the bridge upon which it rested, and this prevented the expansion joint taking care of the contraction. Neenah and Menasha were out of gas for ¾ of an hour before we got the break repaired.

During the extreme cold weather of the following month, January, 1905, the first drip pot on the line, beyond the Appleton canal, broke square in two at about 8:30 P.M. This pot was entirely in the frost. We

kept pressure on the line until about midnight, when the gas got too strong for the diggers. We then closed the nearest valve toward Neenah and shut down our compressor in hopes of finishing the job before losing the pressure on Neenah-Menasha. The frost was too much for us, though, and it was daylight before we had the pot out of the way and the line connected again. If we had had our pressure storage tank at Neenah then, we would not have lost our pressure. As it was, Neenah and Menasha were out of gas from midnight until 6 in the morning. However, no harm was done, as no gas was used during these hours in these towns, where the saloons close early.

During the past fall we set new valves half way between the old valves, so that now they are only ¼ a mile apart. This enables us to cut the line for repair work with a loss of only half the gas lost formerly.

In doing this work we discovered a bad leak at one of the old valves about half way between Appleton and Menasha. The ground at this point is soaked with water the year round owing to the natural drainage. This valve had been set 2 years previous and a Dresser coupling had been used on the Neenah side of it. We found the first length of pipe on the Neenah side of the Dresser coupling eaten full of holes until it resembled a sieve. It was plainly the work of electrolysis caused by the return current jumping around the Dresser coupling on its way back to the Appleton power house. The pipe was as good as new on the Appleton side of the coupling. I am convinced that if these couplings are to be used in the future, as they are bound to be on account of their convenience, a bond must be run around them and soldered to the pipe line on each side. Then at a point where tests show the greatest amount of current leaving the pipe for the track or the power house, lay 2 cast iron lines in parallel with valves so that either line may be shut off while the other is in use. The cast iron resists the electrolytic action for a vastly longer period than wrought iron or steel, and the chances of both lines giving out at the same time are very small.

In regard to the loss of candle power due to compression of coal gas I cannot speak from actual photometric tests, but as far as its effect commercially is concerned I believe we may neglect it. The loss of candle power from low temperature in holders and bridge pipes exposed to the weather is certainly far greater than the loss from compression.

Since covering our high pressure line on the bridges, and taking gas from the inlet of the Appleton holder instead of the outlet, I can see no difference in the candle power in Appleton and Neenah.

We made some short tests on boiler fuel consumption per 1,000 feet of gas compressed during the past month. We connected the compressors to an independent boiler and weighed accurately the fuel used during the hours the compressors ran continuously. The results were as follows: Youghiogheny lump coal (compressors working against 17 pounds average gas pressure), 9.03 pounds per 1,000, at $4.15 per ton, equals 1.87 cents per 1,000.

Coke (average gas pressure 18 pounds), 11.67 pounds per 1,000 at $4 per ton, equals 2.33 cents per 1,000.

Breeze (average gas pressure 16 pounds), 12.5 pounds per 1,000 at $3 per ton, equals 1.88 cents per 1,000.

No allowance was made for friction or radiation from steam line. Gas was measured by two 300-light meters.

(To be Continued.)

"Why Gas Doesn't Burn."

By "Observer."

All tradesmen, manufacturers and supply agents are familiar with "kicking" customers. Many large manufacturing and distributing concerns have regular stock letters printed, like the gas companies, to fit the desired replies to certain patrons who have complained. We find evidence of complaints, just and unjust, everywhere. Let us look at some that make unhappy hours for the gas man. It is true some gas men get hardened to complaints and pay little attention to them. It is also true that some gas men are sensitive and take to heart any entry of complaint against the company. People will "kick." Meters will be complained of as registering incorrectly. Meters will be tinkered with, and oftentimes tinkered with the wrong way, for the customer, and he finds at the end of the month that he has made the registering dials exceed their ordinary speed and run up quite a bill against himself.

These incidents will occur again and again, and likewise many of kindred character. However, let us examine some of the factors relative to the burning of the gas, and some of the hindrances which might be avoided with a little care.

Lava tips are often out of condition in gas jets. There are conditions prevailing in the pipe connections that bring about leakages and a checked supply channel for the gas.

There are conditions which prevent perfect combustion Much gas is used for stoves and for various mechanical purposes in the industries at the present time, and it is observed that numerous complaints come from these sources. Often defective combustion makes it impossible for the proper development of the heat actually given out by the flame and losses are sustained. Suppose that we ignite a wax or tallow candle, as shown in Fig. 1. The substances in the wick are ignited and converted into gases. The ignition of the gases makes the flame.

From the scientific point of view, the flame is chaptered off into the various parts illustrated by the shaded portions. The action of the heat upon the wax and wick produces the volume of unconsumed gas, which forms constantly and as it burns, into the conical shape shown immediately about the wick from *A* to *B*. Next we notice the half circle, shaded portion at the base of the flame, designated at *A*. This is due to the combustion of carburetted oxygen with air, the latter contacting with the former from the great exterior reservoir of space. Outside the cone is the brilliant portion of the flame, *C*. The oxygen of the air unites with the hydrogen. An intense incandescence results and a luminous flame is made. Outside of all is the portion *D*, in which the heated atoms combine with the oxygen and are converted into carbonic acid. Many trivial factors combine to disturb tho free burning of the gas or candle flame—the formation of the burner, the atmospheric conditions of the room, the arrangement of the pipes.

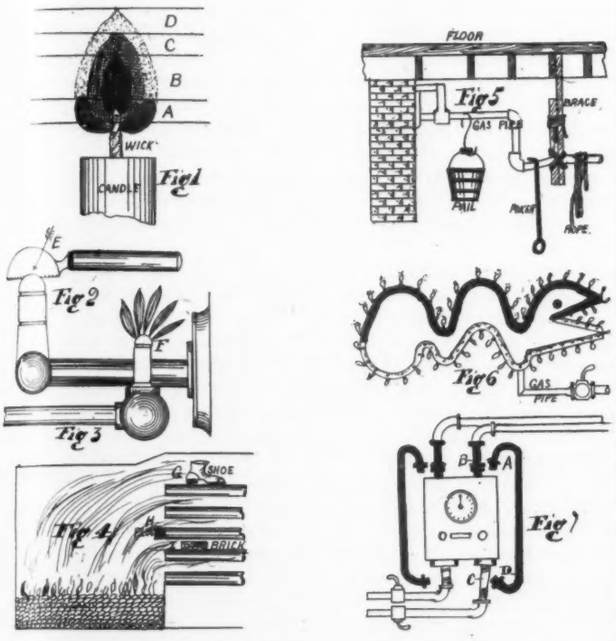
We can refer to but a few examples. The householder and the user of gas should be furnished with little handy burner cleaning devices so as to remove debris from the slots of the tips, as at *E*, Fig. 2. Often the tips are so clogged that the flame is separated like at *F*, Fig. 3. A piece of twine is often drawn through. Sometimes a piece of cardboard or paper is better than a regular instrument used for this purpose. Speaking of burning gases under difficulties reminds the writer of a firm that undertook to make gas for private uses. They were "mad" with the gas company and installed a little 1-horse plant of their own. Time passed and their apparatus proved unprofitable. It failed to generate properly. An examination revealed a "plugged" flue, as at *H*, Fig. 4, in which is exhibited the interior of a firebox.

The tube was leaky, and rather than go to the expense of putting in a new tube the leaky one was stopped at each end, thus putting this much of the apparatus out of working order. An old shoe was lodged at *G*, on top of the tubes beyond the reach of ignition, and baked hard, and served to assist in checking the draft. A brick was lodged between two tubes, as at *I*. In another place where they failed to get proper service from the gas supply it was found that the picture shown in Fig. 5 prevailed in the basement of the building. The gas pipes were utilized as means for supporting articles. A pail containing a number of pounds of whitewash stuff was hung with a hook of wire to the pipe and its weight caused the pipe to be depressed.

A heavy iron poker was also supported on the pipe as a convenient place for the same. Then there was a number of pounds of hemp rope tossed over the pipe. Someone at one time had seen the depressed pipe and foreseeing a break therefore nailed some brace strips of wood to a floor beam and roped the pipe to the brace. This helped support the pipe; but the strain caused the pipe to eventually sink more and finally collapsed. Thus are gas pipes abused and the flow of gases through the same checked by the neglect and carelessness of house owners. How some people will "kick" on bills without just cause! One candy manufacturer and dealer believed in advertising. He had a sign made of pipe like that shown in Fig. 6. This snake-like form was set up on the top of the ridge of the store roof and burned at night lighting up the entire square. All went well until the gas bill was due at the end of the month. Then the cost for the gas astonished the confectionery maker and he objected. He put in his letters of complaints and never mentioned the gas consuming serpent on the roof. An investigation brought it to light. Then the man said that the maker of the sign had designated a certain expense per night for the gas consumed. Unfortunately this stated cost was but a fraction of the real cost, and hence the surprise and kick of the party who had to pay the gas bills. The result was the cutting off of every other burner in the form.

Finally we refer to a trick of a party who tried to cut down gas costs.

He had two pipes made of the shape shown on the outside of the meter in Fig. 7.



He disconnected the main at *B* and *C* on either side of the meter and inserted the section *A-D*. This required the use of a wrench with which to turn off the couplings and meant quite a lot of work. By this means the man cut off the meter and no registering would occur while the gas burned. In the event of an inspection by the gas people the trick would have been discovered. This man actually made the alteration every evening and replaced the same each morning, about half the time through the month, thereby cutting his gas bill down about one-half; but he forgot to make the change one morning when he was in a hurry and the gas man happened to inspect that day and discovered the trick. The gas people were good enough to let the man off for his first offense, on condition that he reimburse the company for the gas he failed to pay for during the previous months.

A French Gas Washer.

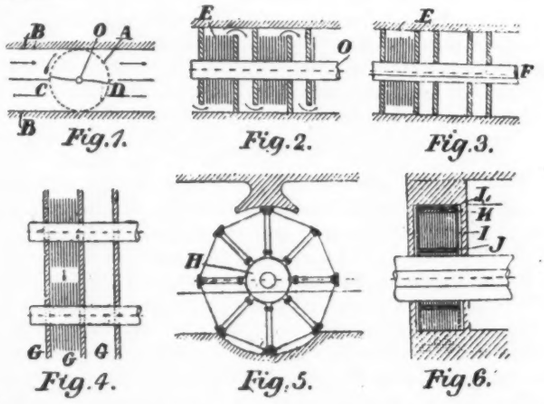
The *Journal of Gas Lighting* notes that towards the close of last year the Compagnie pour la Fabrication des Compteurs et Matériel d'Usines á Gaz, of Paris, took out a patent for a gas washer. The specification appeared in a recent number of *Le Gaz*, and from it the following particulars have been taken:

The apparatus has been designed to bring together a liquid and a gas, and to create a sufficiently large contact surface to effect a complete reaction of one upon the other. The operation may have for its object washing gas to free it from one of its components, such as ammonia; condensing a vapor by a cold liquid; the evaporation of a warm liquid; the saturation of a liquid by a gas, with the view of obtaining a concentrated solution; and, finally, the reaction of a gas upon a liquid. The feature of interest in connection with the washer lies in the fact that the reciprocal movement of the two fluids may be produced by the motion of the washing mechanism itself.

The apparatus shown in Fig. 1 consists of a cylinder *A*, constructed of perforated sheet iron, revolving upon a shaft *O* in a channel *B*, which it fits exactly. The cylinder is filled with inert material intended to form a considerable contact surface. The channel is half filled with liquid, and the rest of the space is occupied by the gas to be treated. If the cylinder is turned in the direction of the arrow, there is produced at *C* and *D* an alteration in the level of the liquid, which has the effect of sending some of it into *C*, followed by a corresponding inlet of gas, and the entrance of liquid into *D* in proportion to the quantity of gas expelled.

The result is a displacement of the liquid from right to left, and of the gas from left to right. The upper part of the cylinder presents a considerable contact surface between the two fluids—one moistening the inert material and the other filling the intervals.

The arrangement of the washer will be understood from the following diagrams.



Figs. 2 and 3 represent a plan and an elevation of an apparatus based upon the principle just laid down. It consists essentially of a shaft *O*, to which are fixed plates *E* of metal, glass or any other inert matter, according to the use to which the machine is to be put. These plates take the place of the material contained in the cylinder in Fig. 1. They lend themselves to a better utilization of the available space, by presenting greater contact surfaces in proportion to the room occupied. In Fig. 3 the line *F* represents the separation surface of the gas and liquid. The plates *E* are joined together in groups, which revolve in the chambers *A*, limited right and left by partitions arranged zigzag, and communicating with each other by pipes. In this way the different groups of plates are mounted in series upon the same shaft; and if the two fluids are allowed to keep up the movement imparted to them by the friction of the plates, they displace each other in opposite directions, and the washing process is carried on methodically. The quantity and movement of the two fluids may be regulated as desired.

Another arrangement is shown in Fig. 4. It consists in employing several plate-bearing shafts and forming parallel channels *G* in such a way that each group of plates is traversed by a liquid coming from the corresponding group on the neighboring shaft. Thus on each shaft there are plates parallel to each other, and working in series with those on the other shafts. Another apparatus of this kind is shown in Fig. 5.

There the shaft is surrounded by cement in the space *H*, to secure it, if needful, from being acted on by the gas under treatment, but removable for ordinary working. The shaft traverses a series of partitions which limit the different chambers, as shown in Figs. 3 and 4. One of these is represented in Fig. 6. The shaft carries at each end a metal plate *I*, serving for the support of the rods *J K L* going from one to the other. The rods *J K* are provided with notches, in which rest plates of glass or other material, maintained (with a certain amount of play) in any desired position.

The appliance described operates in the general canalization, which is sufficiently large to allow a man to get to it easily for cleaning, as well as for changing the plates. The different parallel conduits which are carried by the same shaft are separated one from the other by a channel communicating with them by holes which allow of clearing. The lateral walls of the channels are provided with manholes and sight-holes through which the working and condition of the appliance can be inspected.

The Position of Thoria.

The *Gas World*, in its issue for February 10th, asks: "Why have the German holders of the world-wide monopoly in thoria suddenly reduced their price for the article by practically one-half?" and then goes on to say: That is a question that a good many people have been asking during the past week. It cannot be that the price has been reduced because of any falling-off in demand for the material, for sale of the incandescent mantles is growing enormously, and at a rapid rate. Is it, then, that the monopolists are threatened with competition? From inquiries we have made in likely quarters we are in a position to say that this is at least part of the explanation of the action of the German Convention. Thoria from sources other than those controlled by the Convention has been coming upon the market in sufficient quantity to cause serious concern to the monopolists, and it is said that some of their best customers have been enticed from their allegiance

by offers of lower prices from other quarters. A considerable business has also been done in the recovery of thoria from mantle ash, and the resale of this recovered thoria has to some extent cut into the business of the Convention. Hence it may fairly be assumed that the recent reduction in price made by the Convention has for one object the squeezing out of the "interlopers" and the mantle ash exploiters, neither of whom is believed to be particularly strong financially. Indeed, the Convention have carried the war to the extent of themselves becoming purchasers of mantle ash. But there would seem to be an additional reason for the action of the Convention. The contract between them and Messrs. Gordon and Dreitas, who hold the principal concession for monazite sand in Brazil, expires in July, 1907. By that contract a minimum price is fixed for thoria, and anything obtained above that minimum is divided between the parties as to one-third to the Convention and two-thirds to Messrs. Gordon and Dreitas. It will be seen, therefore, that the Convention do not stand to lose so much by the present reduction in price as would appear at first sight; and it is suggested that one object of the reduction may be to secure better terms for a renewal of the contract with Messrs. Gordon and Dreitas.

As to the effect of the reduction in the price of thoria upon the price of mantles, that is not expected to be very great. The mantle manufacturers are said to hold large stocks of thoria at the old price, and the wholesale dealers in mantles are also well stocked. It is also pointed out that the Convention control by far the largest output of thoria, and that consequently they may put up the price just as suddenly as they have now reduced it. In any event, the reduction in the price of mantles that could be made is said not to exceed 2s. per gross, which would affect the retail price of the mantle by less than a farthing.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, Feb. 10th, 1906.

Sales of Gas in Ireland.—Tar Flooring.—Death of the Governor of the Gas Light and Coke Company.—Naphthaline Experiences.

Mr. Kirkham, of New Ross, commenced his inaugural address, delivered at the meeting of the South East of Ireland Gas Association, a few days ago, by quoting some statistics taken from the *Gas World* "Year Book," with regard to the sales of gas in Ireland in 1905, as compared with those for 1904. They comprise returns from 111 undertakings, and of these 53 show an increase, 47 remain about the same, and 11 exhibit a decrease. Two of the latter class are large concerns, and show a substantial decrement, notwithstanding an important increase in the number of consumers, and in gas cookers. On the whole the total quantity made is slightly less than in 1904, although over 10,000 consumers have been added to the roll, and 6,350 cookers. These figures, taken in conjunction with my remarks last month, serve to illustrate the fact to which attention was directed that, if sales are to be maintained it can only be done by the aid of increased outlay in the way of slot meters, cookers and free fittings. In trying to fix the cause of the lessened consumption per consumer, it must be remembered that there are several factors. The milder winter season of 1905 as compared with the corresponding period of 1904, the economy secured by the introduction of the incandescent gas burner, and the competition of other illuminants, were respectively instanced by the speaker as contributory causes. And in these respects the experience of Ireland represents that of the whole civilized world. But the author carries his investigations further, and shows that there is room for pushing the the sale of gas. Referring to the generally observed fact that an increased sale of gas follows the establishment of an electric supply in the district, he explains the matter by saying that the advent of a competitor leads to increased activity, and the adoption of a more progressive and enterprising policy. Hitherto the directors have pursued a somnambulistic policy, and when aroused they begin to push their business. But the president also observed that in certain districts there was no competition, no increase of trade or of population, but yet a steady increase in the sales of gas. Quoting from personal experience, he instanced a small concern where the sales were increas d by 250 per cent. in 8 years.

This desirable result was due to the adoption of an intelligent, progressive, and businesslike policy. The works were put in an efficient condition and then they started to push the business. This indicates sound ability and foresight. In many cases the idea is to make sure of the business first and then to provide the extensions afterwards, with the result that much of the new business gained is eventually lost, and further progress receives a severe check, whilst the hurriedly sent out orders for new plant are not placed to the best advantage, and the same as regards the issue of new capital. The moral is that there is no necessity to wait for competition, but that the positon can be dealt with at once. Not only that but it is easier and cheaper to do so. If a 10 per cent. increase of business is obtained in the presence of an active competitor, it follows that the same amount of trouble and expenditure would secure 15 to 20 per cent. in his absence. With regard to Ireland, the works are mostly small and the sales per head of the population are probably much lower than in England or Scotland. Some of this may be due to local circumstances, but in all three countries there is room to take up and apply the sound conclusions arrived at by Mr. Kirkham.

This does not exhaust the indebtedness of the profession generally to the gentleman of New Ross. For at a later period in his address he referred to the need for finding new outlets for tar, looking at the very low price now obtainable for it, and in that connection described an excellent form of solid floor suitable for public buildings, schools, etc. The site having been well rammed and levelled, a layer of cement concrete about 3 inches thick was laid, followed by a layer of asphalt made of hot tar and small coke, 1½-inch to ¾-inch cube. This having been well rolled and levelled the laying of the floor boards was proceeded with. They were 1¼-inch thick, tongued and grooved, and before each board was placed a liberal supply of hot tar brushed on to the asphalt, so that it was bedded solid, and secured by nails driven through into the asphalt. It made a perfectly solid waterproof floor, and as it saves the cost of dwarf supporting walls and floor joists, also the need for ventilation, it is not more costly than the usual plan and it also does away with dry rot, rats, and other evils due to having vacant spaces under floors. Last year I constructed an excellent floor for a set of large purifying boxes, without using any cement whatever. The materials consisted of stone chippings, tar, and spoil from the burnt out retort settings. Large flat pieces of the latter were laid out, fairly close together, on the site, which had previously been well rammed. The chippings were dried and well mixed with hot tar to the consistence of mortar, and then carefully spread and well rammed so as to fill up all cracks and crannies solid. Another layer was put on in the same way, and finally a course of brickbats, and the surface finished off level. This set in one solid block was quite strong enough to take any evenly distributed weight. Floors of workshops, stables, etc., may be treated in a similar way, the thickness being proportioned to the work to be done on them.

A sad significance attaches to the meeting of the Gas Light and Coke Company this time. While the deputy chairman, Mr. Corbet Woodall, was expressing condolences with the governor, Sir W. T. Makins, who was absent on account of illness, and who with the exception of the last meeting had occupied the chair at every gathering since his appointment in 1883, and expressing hopeful news as to restoration of health, in which the meeting joined to the extent of unanimously re-electing Sir William to his seat on the board, news was received that the end had come. As the head of the largest gas undertaking in the country, Sir W. T. Makins occupied a unique position, and lived a public life, his actions and policy arousing as much interest and exciting as much criticism as those of a Cabinet Minister. He was accustomed to deliver a lengthy address, dealing with the affairs of the Company, at each half yearly meeting of shareholders, and one may say without being invidious that the published reports of the governor's speech were read with the greatest interest as reflecting in some sense the position of the gas industry throughout the country. There are others, notably Sir Geo. Livesey, who hold the helm of large undertakings in such a manner as to affect the public as well as the individual interest, and who are able, like the late governor of the Gas Light and Coke Company, to set forth their views in true statesmanlike style, but the addresses of the late Sir W. T. Makins will always occupy a special position on account of the magnitude of the figures dealt with, the policy of amalgamation so successfully carried through, and with which he was largely associated, and the particular character of the district supplied. It is needless to say that Sir William's views did not please everybody, and were occasionally the subject of spirited criticism. But there is a unanimous agreement as to the personality, the sincerity and ability with which the onerous duties were discharged. It is remarkable that although he occupied several public positions, a director for 40 years, and deputy chairman of the Great Eastern Railway Company for 12 years, amongst many others, Sir William was never heard of in connection with the affairs of any other gas company. As a rule the directors of our largest concerns are also identified

with the fortunes of a few smaller ones, but Sir William's name never appeared in public in such a capacity. The last 10 or 15 years in particular must have been very active times, for the whole of the policy of the company in relation to their consumers has been reconstructed, with the result that lately, at every meeting, there has been gratifying reports as to the securing of large areas of street lighting, principal railway stations and other important work. Sir William will also be specially remembered in connection with the successful Earls' Court Exhibition of 1904, and the satisfactory opposition, in conjunction with the other two London companies, that was afforded to the proposals of the London County Council before Parliament, which would have been a serious injury to the prospects of the industry at large, if allowed to pass into law.

I have lately had some little trouble from naphthaline deposits in the services, which is probably due to the not uncommon, but not on that account to be commended, practice of putting 500,000 cubic feet a day through a condenser and scrubber only equal to 250,000. Arrangements were made for doubling the size of the condenser and putting in a friction tar extractor last autumn, but too late to enable the work to be completed before the heavy season came on, and so it had to stand over until the spring. Under these circumstances I have been trying a fluid called a "Gazine" which presented very good credentials. It is simply admitted at the outlet of the station meter in regulated quantities—the vendors recommend 1 gallon per 70,000 cubic feet of gas if it is desired to remove deposits of naphthaline and half to one-quarter of that proportion if it is used as a preventative. It volatilizes freely at ordinary temperatures, so is readily absorbed and held by the gas. There is no doubt about that, as a few drops spilled on the ground disappears in a few seconds and the smell is such that it can be detected in the next street. Some people imagine that a strong characteristic odor is indicative of the virtues of a manure or of a disinfectant, and if the same applies to a naphthaline remover "Gazine" certainly has a good chance. The city police are supposed to take charge of undesirable characters and escort them gently but firmly beyond the boundaries of the borough, and "Gazine" is a sort of chemical policeman that is guaranteed to take charge of any objectionable naphthaline crystals in the mains, services or fittings, and convey them safely beyond the precincts of the burner. It enriches the gas to the extent of half a candle, and in every way appeals to one's sympathies. The cost of the whole fit-out can be reckoned in shillings, and beyond watch and the storage cistern and adjust and the drip cock to secure the correct rate of supply, there is no further trouble. There is nothing extra to be taken out of the pipes or drip boxes, and it is nice to think that the whole lot, policeman and vagrant, goes on to help make the meter work instead of being deposited in a worthless form that necessitates some expense and trouble for disposal. The points one wants to be assured of in connection with a scheme of this sort are that the fluid is really carried on to the burners, right out to the extremes of the district, without causing any deposits of liquid between the gasholder and the burners, and that it exercises no prejudicial action on the leathers of the dry meters or pressure regulators. It has not been in use here for a sufficient time to speak on these points, but so far there has been no trouble with it, and if it possesses no really objectionable qualities there is some advantage in using it as an enricher, apart from anything else. It costs less than 1 farthing per 1,000 cubic feet and enables a reduction to be made in the proportion of cannel or other high-class coal that is used. At present most of the naphthaline trouble is within a radius of a mile from the works, and we want to make sure that it is got rid of altogether. Shipping it further on towards the outside of the supply district would be a disadvantage rather than otherwise.

The usual reports showing the results of the working during the second six months of 1905 are now being issued and judging from those already to hand it would appear that business is in a satisfactory position. Increased sales of gas are the usual experience notwithstanding the unfavorable conditions of weather to which some allusion has already been made. This seems to show that the unavoidable reduction due to the replacement of flat flames by incandescent burners that give more light though only using half the gas has now touched bottom, and that in future the full benefit of all extensions will appear in the rental book. Coal has been low in price but unfortunately the same applies to coke and to tar. The current prices offered for the latter residual in particular are such as to lead managers to seriously consider finding fresh outlets for it or else turning it to account on the works. It is worth more as a fuel than can be obtained by works at any considerable distance from the distillery, where the low initial price is still further reduced by the freightage charges. But in all cases there is a balance sufficient to pay full dividends, and to prevent any misapprehension it should be stated that this requirement does not mean more than about 6 per cent. per annum on the whole expended capital. Some of the original capital may be entitled to 10 per cent., but that raised later is limited to 6 or 7; then there is debenture stock at 4 cent., and premium capital not entitled to dividend. Full dividends per sound big, but in the case of gas undertakings it is not such a very tremendous scoop after all.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE Illuminating Engineering Society will hold its next regular meeting in the Edison Auditorium, 44 West 27th street, New York, at 8 P.M., the evening of Friday, March 9th. Papers are promised on the following subjects: "The Luminous Arc," by Mr. E. L. Elliott; "The Inverted Incandescent Gas Burner," by Mr. Victor Rettich," and "Illuminating Engineering from the Architects' Standpoint." The papers will be open to general discussion, and all interested in the subjects named are cordially invited to assist in the proceedings.

THE Gas Machinery Company, of Cleveland, O., has been awarded a contract for the installing of an 11-foot set of water gas apparatus, complete, at Grand Rapids, Mich.

A CORRESPONDENT in Clinton, Mo., forwards the following under date of Feb. 26th: "How old is Weston, Mo.? Mr. C. H. Pattison, who received a franchise to supply Atchison, Kas., with natural gas, secured a similar franchise at Weston. In excavating in the streets of that town the other day his workmen uncovered 5 blocks of old iron gas pipe. You may not know it, but Weston was once so large and important that it had an artificial gas plant. Some say it was over 50 years ago. The pipe uncovered was used in the distribution of gas, and when the plant was abandoned it was left in the ground. Pattison's men tested the pipe and found it to be in good condition, although it has probably been there half a century. Weston was once larger than Kansas City, St. Joe, Leavenworth or Atchison, and is said to have been the largest town between St. Louis and San Francisco. It now has less than 2,000 people."

"W. B.," writing from Tacoma, Wash., under date of the 25th ult., says: "The Tacoma Gas and Electric Light Company has announced its intention of making more than $75,000 worth of improvements this year, and of reducing the price of gas, effective March 1, from a net rate of $1.40 to $1.35. W. W. Seymour, President of the Company, will leave for the East Saturday to purchase materials for the improvements. Several hundred tons of pipe have been ordered with which to extend the mains to residence districts not now supplied with gas. A 16-inch main 1 mile in length will be laid through the business section, carrying twice the amount of gas conveyed by that now in use. A complete plant for the manufacture of illuminating gas from California crude oil will be installed. The oil will be shipped by water and stored in a mammoth tank on the water front. The old coal gas system may be discontinued at any time or run in connection with the new apparatus, the arrangement being governed by the comparative cost of coal and oil in accordance with the fluctuating prices of these raw materials. The new gasholder which has just been completed is the second in size in the State, having a capacity of 500,000 cubic feet. The first holder built by the Company in Tacoma in 1888 had a capacity of 50,000 cubic feet. The new scale of prices at the rate made to large consumers is as follows: For each additional 1,000 feet above 10,000 feet and up to 20,000, $1.45 gross, $1.30 net; for each 1,000 feet above 20,000 and under 30,000, $1.40 gross, $1.20 net; for each 1,000 feet above 30,000 and under 50,000, $1.20 gross, $1 net; for each additional 1,000 feet over 50,000 cubic feet, $1.10 gross, 90 cents net."

THE Gas Machinery Company, of Cleveland, O., has been awarded a contract for the installing of a 6-foot water gas set, complete, at Pittston, Pa.

THE Owensboro (Ky.) Gas Light Company's improvements have been completed, and the plant is now up to every demand that can be made on it.

THE Peoria (Ills.) *Star* is our authority for the statement that Mr. Sumner R. Clarke, President of the Peoria Gas and Electric Company, has granted a 30-day option to certain New York capitalists that contains a proposition for change in control of the Company.

MR. ALFRED W. GLASS and associates, of Detroit, Mich., to whom some time ago was granted a franchise for the construction of a gas plant at Iron Mountain, Mich., has virtually completed the details of the construction contracts. Mr. F. N. Pettigrew, of Ludington, Mich., is in charge as Engineer.

THE Illinois Pressure Gas Light and Fuel Company, of Chicago, has been incorporated by Messrs. Ralph E. Smith, Robert L. Boughton and Fred. L. Kaust. On the face of the papers the project does not look very important.

ACCORDING to advices we are informed that at a recent meeting of the Paulsboro (N. J.) City Council the borough engineer was instructed to complete plans for the construction of a gas plant to be operated on municipal account.

THE gas plant of the the Baton Rouge (La.) gas and electric plant is to be reconstructed. New Orleans capitalists have secured complete control of the Company. Mr. John D. Fisher represents them.

MR. W. W. PROUT and associates have been granted the right to construct and operate a gas works in Miami, Fla. We hope, although doubtful about it, that the scheme will be successful.

THE stock of the Green Bay (Wis.) Gas and Electric Company has been purchased by the owners of the Green Bay Traction Company. There will be no immediate change in the working force.

MR. W. H. MCGOLDRICK is our authority for the statement that the gas plant at Palestine, Tex., will be finished before September 1st.

MR. C. A. REESE has applied to the authorities of Fayettevile, Ark., for the right to there construct and operate a gas plant.

MR. LEE H. NEWBERT, formerly Manager of the Marysville (Cal.) Gas and Electric Company, has been appointed Superintendent of the Peninsular Division of the California Gas and Electric Corporation. His successor at Marysville is Mr. J. E. Poindegstre, of the Redwood City branch.

THE Brooklyn Union Gas Company's "head men" had a dinner last month, which was well served at the Willoughby Mansion. The man in charge was Mr. P. F. Sperry, and over 200 good eaters took part. Amongst them were Messrs. Rossiter, Benson, Jordan and Stanniford. It is proposed to make the affair an annual one; and the idea is a good one.

THE proprietors of the Suffolk Gas and Electric Light Company, of Bay Shore, N. Y., have put the selling rates for both commodities on a lower scale. The concession amounts virtually to a reduction of 10 per cent. Manager Hallock says that important main extensions will be made this spring.

"W. T. R.," writing from Middletown, Conn., under date of February 24th, incloses the following: "At a meeting of the Directors of the Middletown Gas Light Company, held some days ago, it was voted that, after March 1st, the price of gas be reduced from $1.60 to $1.40 per 1,000 feet, with a discount of 10 cents per 1,000 feet for prompt payment, which makes the net price $1.30 per 1,000 on all bills, provided they are paid within 10 days. Gas for ranges will be the same, so that in the future gas for all purposes will be at the same rate, viz.: Gross, $1.40; net, $1.30. The Company is to be commended for its voluntary action in reducing the rates for its product. Last year it made a large expenditure to increase the capacity, putting in a new gasholder at the plant on South street. The proprietors hope to induce by the lowering of the rates a much larger consumption of gas and in that way make up the difference in the price. The combined rates as announced by the Company are less than in any other city of the size in the State. That the Company was willing to reduce the price of its product without request or pressure of any kind being brought to bear on the officials is satisfactory evidence that it has the interests of the city at heart, and that it is not actuated entirely by a desire to make large profits at the expense of the people. It is probable that the effect will be, as anticipated by the officers and directors, a largely increased consumption of gas."

THE Consolidated Gas Company, of Baltimore, Md., is now comfortably located in its handsome, new office quarters at Liberty and Lexington streets.

MR. HENRY KINCAID has been retained as Manager of the Jackson (Tenn.) Citizens Gas Light Company, the sale of which to Chicago capitalists was recently reported.

MR. NELSON PURDY, one of the organizers of the Peoples Gas Light Company, of Cleveland, O., died at his home in Cleveland the morning of the 20th ult. He was in his 85th year, and had been engaged in business in Cleveland since 1852.

MR. A. W. BYERS, incloses the following, under date of the 27th ult., writing from Lynn, Mass.: "The opening of the new workshop of the Lynn Gas and Electric Company was made some days ago, the main feature of the event being the presentation to Superintendent F. W. Mace of an office chair and hat tree. An active gas man as Mr. Mace has long been is not as a rule caught napping, but on this occasion, the only time in his gas career of over 25 years, he is free to confess that his workmen gave him a complete suprise, threw him off his guard and be it said, took him into camp. It was planned that while en route to his home to call up the house by 'phone to the effect that he was wanted immediately at the new shop, and that he couldn't get there any too quick. The shop was kept in total darkness, but at each arc lamp a man was stationed in readiness to light up instantly when signalled. Careful watch was kept at the office window, the signal being given from that point. Everything worked harmoniously, and on entering the office Mr. Mace was met by Mr. Norcross, who said: Allow me to inform you that by a unanimous vote you have been chosen chairman of this meeting, and it gives me pleasure at this time to present to you, in behalf of this assembly, an office chair and hat tree. The chair being of hard wood represents the strength and solidity of this corporation, the leather typifies the great shoe and leather industry of Lynn, who are large patrons of this Company; the brass on these articles reminds us of our electrical department which, at the age of 'Sweet 16' exhibits the audacity of making inroads in our lighting service with the 'mellow rays of the incandescent lamp.' It is hoped and anticipated that the gas range system with its usual activity will be the means of retaliation to a certain extent as an offset, and make this chair most inviting to your form and—that you may rest at eventide within its arms and enjoy a long and happy life is the earnest desire of all who are present. On gathering himself sufficiently, Mr. Mace responded in fitting remarks thanking all present for their kindly remembrance. A bountiful collation of ice cream, frozen pudding, cake and choice cigars was served and enjoyed. The festivities terminated with the following programme: Joseph Flanagan sang 'Mary Jane' in a rich baritone voice and also danced an elegant Huguenot can-can, Robert Keenan recited 'The Face on the Bar Room Floor,' and Patrick Flanagan 'Kelley's Dream.' George Wiggin took first prize in the ice cream contest. The refreshment committee consisted of A. W. Wallace, Louis M. Seney and H. M. Lentz. The following were present: Frank Carter, Martin Morgan, P. Gorham, W. J. Greer, C. A. Silsbee, Aaron Jones, John Killilea, T. Leary, A. W. Shaw and A. Call."

Engineering News in its issue for last week said: "The principles of possible, far-reaching significance are set out by the New York State Gas Commission in support of its recent order for 80-cent gas in New York city. The first of these is that the gas companies are entitled to a reasonable return, only "upon the value of the property actually employed in the gas making business," and the second is that franchise values should not be included in the valuation named. In other words, not only is watered stock excluded from consideration, but the value of franchises as well. It is assumed, however, that the franchises involved in the case of the New York Companies were the virtual gift of the public. The fact that under the franchise law of the State of New York a heavy valuation is placed on these franchises is held by the Commission to be of no force, since the tax imposed on these franchise valuations is 'charged against the public as an expense of operation, and in reality is paid by the consumer, not by the company.' It is interesting to note in this connection that in the schedule for a comparative summary of receipts and expenses under municipal and private ownership, submitted at the recent Washington conference on municipal accounts (see page 215, *Engineering News*, February 22d, 1906), 'taxes and franchise payments' are entered as one of the 'charges on account of revenue.' The schedule named was prepared by Mr. Harvey S. Chase, M.Am.Soc.M.E., a public accountant of Boston, Mass., for use in the municipal ownership investigation now being conducted by the National Civic Federation. Mr. Chase, it may be added, was formerly superintendent of a private gas and water company, and has made a number of investigations of municipal undertakings that resulted in reports unfavorable thereto, so for these and other reasons he cannot be considered, to say the least, a partisan for the municipal side of public questions. We believe that the adoption by the New York Gas Commission of the principles outlined above may prove to be a most important step in the establishment of just relations between public service corporations and the public, and that eventually the corporations may come to the same conclusion."

The Market for Gas Securities.

The recommendation of the State Commission of Gas and Electricity that the selling rate for gas by the Consolidated Gas Company be put at 80 cents per 1,000, on and after May 1st, backed up by the passage in the Assembly of the Agnew bill, caused a tremendous slump in local gas share values. Consolidated closed to-day at 154 to 154½, and Brooklyn Union is 148 to 155. Investors and possible purchasers should remember that the rate is not yet legally determined. Lawmaking is not confiscation, as New York understands it.

Baltimore Consolidated is 88 bid; Peoples, of Chicago, is 96 to 96½, and Washington, (D. C.) is 302½ to 305.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

MARCH 5.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	154	154¼
Central Union, Bonds, 5's	3,000,000	1,000	108	110
Equitable Bonds, 6's	1,000,000	1,000	..	105
" 1st Con. 5's	2,300,000	1 000	118	120
Mutual	3,500,000	100	275	290
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co.. Bonds, 5's	11,000,000	1,000	107	109
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	..	98	104
Northern Union, Bonds, 5's.	1,250,000	1,000	105	107
New York and East River.. Bonds 1st 5's	3,500,000	1,000	112	114
" 1st Con. 5's	1,500,000	...	106¼	108½
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
Bonds, 1st Mortgage, 5's	1,500,000	1,000	111	114
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	148	155
" " Bonds (5's)	15 000,000	1,000	112	113
Bay State	50,000,000	50	⅜	..
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	509,000	1,000	95	100
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000.000	1.000	47½	50
Buffalo City Gas Co.	5,500,000	100	10	12
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co	29,500,000	100	103¾	104
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,026,500	100	107½	108
Consumers, Toronto	,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	88	88½
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
" Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	..	..	100
Detroit City Gas Co	5,000,000	50	..	50
" Prior Lien 5's	4,618,000	1,000	..	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	39	40
For Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	55	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
" Bonds, 5's	10,500,000	..	110	110½
Indianapolis	2,000,000	..	60	70
" Bonds, 5's	2,650,000	..	104½	105
Jackson Gas Co	250,000	50	82	..
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,823,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	.	105
Preferred	2,500,000	100	95	110
Bonds	10,000,000	1,000	108½	109
Lafayette Gas Co., Ind	1,000,000	100	..	60
Bonds	1 000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	85	87
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co	1,000,000	100	110	..
Newark, N. J., Con. Gas Co.	6,000,000	..	56	58
Bonds, 6's	6,000,000	..	137	138
New Haven	2,000,000	25	200	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	96	96⅛
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co..	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104½	105¼
San Francisco, Cal.	15,800,000	100	58½	58¾
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	92	..
St. Paul Gas Light Co	1,500,000	100	45	47
1st Mortgage 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,465,000	1,000	96¼	..
Syracuse, N. Y.	1,975,000	100	50	55
Bonds	2,047 000	1,000	102	..
Washington, D. C	2,500,000	20	302½	305
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	..	..	..
Wilmington, Del	600.000	50	230	..

Advertisers' Index.

GAS ENGINEERS.

A. E. Boardman, New York City ... 413
Baxter & Young, Detroit, Mich ... 431
B. E. Chollar, St. Louis, Mo ... 434
Cruse-Kemper Co. Philadelphia, Pa ... 430
David Leavitt Hough, New York City ... 431
Davis & Farnum Mfg. Co., Waltham, Mass ... 432
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
Frank D. Moses, Trenton, N. J ... 420
Fred. Bredel Co., Milwaukee, Wis ... 430
Frederic Egner, Washington, D. C ... 436
H. M. Byllesby & Co., Chicago, Ills ... 414
Humphreys & Glasgow, New York City ... 433
Isbell-Porter Co., Newark, N J ... 434
J. F. W. Jost, Philadelphia, Pa ... 419
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 432
The Gas Machinery Co., Cleveland, O ... 416
The Jeffrey Manufacturing Co., Columbus, O ... 430
United Gas Improvement Co., Philadelphia, Pa ... 427
Western Gas Construction Co., Fort Wayne, Ind ... 440

GAS WORKS APPARATUS AND CONSTRUCTION.

A. E. Boardman, New York City ... 413
Bartlett, Hayward & Co., Baltimore, Md ... 433
Baxter & Young, Detroit, Mich ... 431
Connelly Iron Sponge & Governor Co., New York City ... 429
Continental Iron Works, Brooklyn, N. Y ... 434
Cruse-Kemper Co., Philadelphia, Pa ... 430
Davis and Farnum Mfg. Co., Waltham, Mass ... 432
Deily & Fowler, Philadelphia, Pa ... 436
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
Empire Gas Construction & Improvement Co., N. Y. City ... 421
Frank D. Moses, Trenton, N. J ... 420
Fred. Bredel Co., Milwaukee, Wis ... 430
G. Shepard Page's Sons, New York City ... 431
Humphreys & Glasgow, New York City ... 433
Isbell-Porter Company, New York City ... 434
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 432
Lloyd Construction Co., Detroit, Mich ... 416
Logan Iron Works, Brooklyn, N. Y ... 436
Quintard Iron Works, New York City ... 433
R. D. Wood & Co., Philadelphia, Pa ... 434
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 435
Stacey Mfg. Co., Cincinnati, O ... 435
The Gas Machinery Co., Cleveland, O ... 416
The Jeffrey Manufacturing Co., Columbus, O ... 430
United Gas Improvement Co., Philadelphia, Pa ... 427
Western Gas Construction Co., Fort Wayne, Ind ... 440

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md ... 431
B. E. Chollar, St. Louis, Mo ... 434
Economical Gas Apparatus Construc'n Co, Toronto, Ont ... 413
Fred. Bredel Co., Milwaukee, Wis ... 430
Humphreys & Glasgow, New York City ... 433
The Gas Machinery Co., Cleveland, O ... 416
United Gas Improvement Co., Philadelphia, Pa ... 427
Western Gas Construction Co., Fort Wayne, Ind ... 440

SCRUBBERS AND CONDENSERS.

Continental Iron Works, Brooklyn, N. Y ... 434
Cruse-Kemper Co., Philadelphia, Pa ... 430
Davis & Farnum Mfg. Co., Waltham, Mass ... 432
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
Fred. Bredel Co., Milwaukee, Wis ... 430
Isbell-Porter Co., Newark, N. J ... 434
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 432
Logan Iron Works, Brooklyn, N. Y ... 436
R. D. Wood & Co., Philadelphia, Pa ... 434
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 435
Stacey Mfg. Co., Cincinnati, O ... 435
The Gas Machinery Co., Cleveland, O ... 416
Western Gas Construction Co., Fort Wayne, Ind ... 440

PRODUCER POWER PLANTS.

Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
R. D. Wood & Co., Philadelphia, Pa ... 434

TAR AND CARBONIC ACID EXTRACTOR.

Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
Fred. Bredel Co., Milwaukee, Wis ... 430
Isbell-Porter Co., Newark, N. J ... 434
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 432
Stacey Mfg. Co., Cincinnati, O ... 435
The Gas Machinery Co., Cleveland, O ... 416
Western Gas Construction Co., Fort Wayne, Ind ... 440

AMMONIA CONCENTRATORS.

Fred. Bredel Co., Milwaukee, Wis ... 430
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 432
Michigan Ammonia Works, Detroit, Mich ... 412
The Gas Machinery Co., Cleveland, O ... 416
Western Gas Construction Co., Fort Wayne, Ind ... 440

GAS METERS.

American Meter Co., New York and Philadelphia ... 439
Detroit Meter Company, Detroit, Mich ... 439
D. McDonald & Co., Albany, N. Y ... 437
Helme & McIlhenny, Philadelphia, Pa ... 439
John J. Griffin & Co., Philadelphia, Pa ... 396
Keystone Meter Co., Royersford, Pa ... 438
Maryland Meter and Mfg. Co., Baltimore, Md ... 438
Metric Metal Co., Erie, Pa ... 439
Nathaniel Tufts Meter Co., Boston, Mass ... 438
New York Improved Meter Co., New York City ... 438
Pittsburgh Meter Co., Pittsburgh, Pa ... 437

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia ... 439
D. McDonald & Co., Albany, N. Y ... 437
Helme & McIlhenny, Philadelphia, Pa ... 439
John J. Griffin & Co., Philadelphia, Pa ... 396
Keystone Meter Co., Royersford, Pa ... 438
Nathaniel Tufts Meter Co., Boston, Mass ... 438
New York Improved Meter Co., New York City ... 438
Pittsburgh Meter Co., Pittsburgh, Pa ... 437

PREPAYMENT METER ATTACHMENTS.

New York Improved Meter Co., New York City ... 438
Reeves Mfg. Co. New Haven, Conn ... 435

WATER METERS.

Pittsburgh Meter Co., Pittsburgh, Pa ... 437

GAS AND WATER PIPES.

Davis & Farnum Mfg. Co., Waltham, Mass ... 432
Donaldson Iron Co., Emaus, Pa ... 424
Economical Gas Apparatus Construc'n Co., Toronto, Ont ... 413
R. D. Wood & Co., Philadelphia, Pa ... 434
Warren Foundry and Machine Co., New York City ... 424

GAS COALS.

Berwind-White Coal Mining Co., New York and Phila ... 430
Perkins Co., New York City ... 430
Westmoreland Gas Coal Co., Philadelphia, Pa ... 431

SPECIALTIES FOR OIL AND PIPE LINES.

S. R. Dresser, Bradford, Pa ... 418

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., New York City ... 424

MAIN AND SERVICE LAYING.

Sullivan Bros., Flushing, N. Y ... 418

GAS TAPPING MACHINES.

George Light, Dayton, O ... 434
H. Mueller Manufacturing Co., Decatur, Ills ... 422 42

CANNEL COALS.

Perkins & Co., New York City 430

STOKING MACHINERY.

G. A. Bronder, New York City 429

CONVEYORS.

Adam Weber Sons, New York City 428
Cruse-Kemper Co., Philadelphia, Pa 430
C. W. Hunt Company, New York City 419
Dodge Coal Storage Co., New York City 424
Economical Gas Apparatus Construc'n Co., Toronto, Ont 413
Fred. Bredel Co., Milwaukee, Wis 430
G. A. Bronder, New York City 429
Kerr Murray Mfg. Co., Fort Wayne, Ind 432
The Gas Machinery Co., Cleveland, O 416
The Jeffrey Manufacturing Co., Columbus, O 430
The Link-Belt Engineering Co., Philadelphia, Pa 421
The Link-Belt Machinery Co., Chicago, Ills 424
Western Gas Construction Co., Fort Wayne, Ind 440

CHARGING BARROWS & COAL WAGONS.

Davis & Farnum Mfg. Co., Waltham, Mass 432
Kerr Murray Mfg. Co., Fort Wayne, Ind 432
Stacey Mfg. Co., Cincinnati, O 435

GAS ENRICHERS.

Standard Oil Co., New York City 431
Sun Company, Pittsburgh, Pa 431
The Sun Oil Co., Pittsburgh, Pa 431

COKE CRUSHERS.

C. M. Keller, Columbus, Ind 431
Fred. Bredel Co., Milwaukee, Wis 430
The Jeffrey Manufacturing Co., Columbus, O 430

ECONOMIZERS.

Green Fuel Economizer Co., Matteawan, N. Y 431

GAS COCKS.

H. Mueller Manufacturing Co., Decatur, Ills 422

GAS GAUGES.

The Bristol Co., Waterbury, Conn 416

GAS GOVERNORS.

Connelly Iron Sponge & Governor Co., New York City. 429
Fred. Bredel Co., Milwaukee, Wis 430
Isbell-Porter Co., Newark, N. J 434
Johnson-Reynolds Co., Anderson, Ind 431
Pittsburgh Meter Co., Pittsburgh, Pa 437
R. D. Wood & Co., Philadelphia, Pa 434

CEMENTS.

C. L. Gerould, Pittsburgh, Pa 428

RETORTS AND FIREBRICKS.

Adam Weber Sons (Albert J. Weber's Construction) ... 428
Baltimore Retort and Firebrick Co., Baltimore, Md ... 428
Brooklyn Firebrick Works, Brooklyn, N. Y 428
Henry Maurer & Son, New York City 428
James Gardner, Jr., Co., Pittsburgh, Pa 428
J. H. Gautier & Co., Jersey City, N. J 428
Laclede Firebrick Mfg. Co., St. Louis, Mo 416
Missouri Firebrick Co., St. Louis, Mo 428
National Pyrogranit Co., New York City 428
Parker-Russell Mining and Mfg. Co., St. Louis, Mo ... 429
St. Louis Gas Construction Co., St. Louis, Mo 436

INCLINED RETORTS.

Adam Weber Sons (Graham-Morton [England] System) 428
Fred. Bredel Co., Milwaukee, Wis 430
Parker-Russell Mining and Mfg. Co., St. Louis, Mo 429
St. Louis Gas Construction Co., St. Louis, Mo 428

VERTICAL S'S.

Adam Weber Sons, New York City 428
Connelly Iron Sponge & Gov. Co. (Drake's [Eng.] System) 429
Fred. Bredel Co., Milwaukee, Wis 430
Parker-Russell Mining and Mfg. Co., St. Louis, Mo 429
St. Louis Gas Construction Co., St. Louis, Mo 428

VERTICAL RETORTS, CHARGING AND DISCHARGING VERTICALLY.

Adam Weber Sons, New York City 428

REGENERATIVE FURNACES.

Adam Weber Sons, New York City 428
Bartlett, Hayward & Co., Baltimore, Md 433
Fred. Bredel Co., Milwaukee, Wis 430
J. H. Gautier & Co., Jersey City, N. J 428
Laclede Firebrick Mfg. Co., St. Louis, Mo 416
Missouri Firebrick Co., St. Louis, Mo 428
Parker-Russell Mining and Mfg. Co., St. Louis, Mo 429
St. Louis Gas Construction Co., St. Louis, Mo 428

SELF-SEALING MOUTHPIECE DOORS.

Continental Iron Works, Brooklyn, N. Y 436
Davis & Farnum Mfg. Co., Waltham, Mass 432
Fred. Bredel Co., Milwaukee, Wis 430
Isbell-Porter Co., Newark, N. J 434
Kerr Murray Mfg. Co., Fort Wayne, Ind 432
Logan Iron Works, Brooklyn, N. Y 436
R. D. Wood & Co., Philadelphia, Pa 434
Stacey Mfg. Co., Cincinnati, O 435
The Gas Machinery Co., Cleveland, O 416
Western Gas Construction Co., Fort Wayne, Ind 440

(Continued on page 413.)

SPECIAL NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO.,
N. W. CORNER BROAD AND ARCH STS.,
PHILADELPHIA, February 14, 1906.

The Annual Meeting of the Stockholders of The United Gas Improvement Company will be held at the office of the Company, Northwest Corner of BROAD AND ARCH STREETS, PHILADELPHIA, on Monday, May 7, 1906, at 12 o'clock, noon, for the purpose of electing a President and six Directors, to serve for the ensuing year, considering and acting upon the subject of a proposed increase in the capital stock of the company from 734,500 shares of the par value of $50 each, to 918,005 shares of the par value of $50 each, and transacting such other business as may properly come before the meeting. The stock transfer books will be closed from 3 P.M., April 25, until 9 A.M., May 8th, 1906.

By order of the Board of Directors.

1603-3 W. F. DOUTHIRT, Secretary.

Position Wanted

As Manager or Superintendent by a Practical Gas and Electrical Engineer.

Nine years' successful operation of present property; 15 years' experience. Will be open for engagement April 1, 1906. Best of references from present company.

1601-6 Address, "G. B.," care this Journal.

Situation Wanted.

Bookkeeper or General Office Manager,

In town of from 10,000 to 15,000 inhabitants. Seven years' experience.....

Address, CHAS. E. FOX,

1602-2 NORRISTOWN, PA.

WANTED,

Position as Superintendent of Works,

With company manufacturing 300,000 cubic feet per diem upwards. Coal or water gas.

Address, "J.,"

1602-3 Care this Journal.

POSITION WANTED.

A gas engineer and manager seeks a position as engineer of a large company, or engineer for a syndicate operating a number of gas and electric companies. Ten years' experience in design, construction, operation and management.

1603-tf Address, "PRACTICAL," care this Journal.

WANTED,

A Position as Manager or Superintendent of Gas Works,

By a thoroughly practical man of several years' experience in coal and water gas plants. Good business experience. Can undertake all construction work. Address, "W. M.," care this Journal.

1604-1

WANTED,

Permanent Position as Superintendent Coal, Water Gas or Oil Plant.

Have served as gasfitter, stoker, main layer, service worker, meter and stove setter and street foreman. Have 15 years' experience as superintendent. The past two seasons as solicitor for gas stoves. In a small city in Iowa I placed nearly 600 new consumers in three months' time. Any gas company in the Middle West or South that wants my services and will indorse my method I will increase their output 25 to 50 per cent. in one season. Best of references.

Address, W. E. BELLMER,

1604-1 5963 Aberdeen St., Chicago, Ills.

Position Wanted

By a Practical Water and Coal Gas Maker.

Capable of taking care of all trouble.

Position west of Chicago preferred.

1604-2 Address, "D. N. F.," care this Journal.

WANTED,

Position by a Young Man of Broad Experience,

Especially gas accounts and new business. Can earn a good salary. Address,

1604-1 "R. E. P.," care this Journal.

WANTED,

A Foreman for Street Mains and Services.

Must understand rock work and be a hustler. Address, stating experience and references.

1603-tf "S. H. W.," care this Journal.

WANTED,

A LIVE SOLICITOR,

One who can not only talk gas and electricity, but one who can secure orders. Apply in writing to WM. MORGAN LEWIS,

1603-3 ROCKVILLE, CONN.

WANTED,

For the Library of the Pacific Coast Gas Association, a Copy of "Chemistry of Illuminating Gas," by Norton H Humphrys.

Address, stating price, E. C. JONES, Librarian,

1604-2 816 Shreve Bldg., San Francisco, Cal.

WANTED,

A Desirable Gas Plant in One of the Cities in the Central West.

Well established business preferred. A company engaged in both gas and electric lighting business will be favorably considered. All information will be regarded as confidential.

Address, GUY A. BOYLE & CO.,
Suite 706, Newton Claypool Bldg.,

1602-3eot Indianapolis, Ind.

FOR SALE,

At slightly more than scrap iron prices,

One No. 16 Sturtevant Fan, complete, without board bearing.

Two No. 7 Sturtevant Fans.

One No. 8 Roots Exhauster, 16 inch connection, direct connected to vertical engine.

One No. 6 Roots Exhauster, 16-inch connection, complete, with full size by-pass and butterfly, belted to 7 x 14 horizontal engine.

For particulars, address W. A. BAEHR,
Engineer Laclede Gas Light Company,

1602-3 St. Louis, Mo.

Utilize Your Gas Liquor.

NO EXTRA LABOR OR OPERATING EXPENSES.

IMPROVED AMMONIA CONCENTRATOR.

About 100 in use. Write to

STROH & OSIUS, Patentees, or
MICHIGAN AMMONIA WORKS, • Detroit, Mich.

GREENPOINT

O·X·I·D·E

IS RELIABLE.

We quote "delivered" prices.
May we not send you a sample?

Greenpoint Chemical Works, Brooklyn, N. Y.

COAL TAR —AND— AMMONIA.

Third and Enlarged Edition.

BY

GEORGE LUNGE, Ph.D.

Price, $15. For Sale by

A. M. CALLENDER & CO.,

42 Pine Street, New York City.

(*Concluded from page* 412.)

CHIMNEY CONSTRUCTION.

Adam Weber Sons, New York City..... 434

INCANDESCENT GAS LAMPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 374
General Gas Light Co., Kalamazoo, Mich..... 415
Geo. G. Ramsdell, New York City..... 373
Welsbach Company, Gloucester, N. J..... 426

BURNERS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 374
Wm. M. Crane Co., New York City..... 421

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 374

STREET LAMPS.

Thos. T. W. Miner, New York City..... 424
Welsbach Street Lighting Co., New York and Phila... 426

PURIFIERS.

Connelly Iron Sponge & Governor Co., New York City.. 429
Cruse-Kemper Co., Philadelphia, Pa..... 420
Davis & Farnum Mfg. Co., Waltham, Mass..... 432
Fred. Bredel Co., Milwaukee, Wis..... 430
Isbell-Porter Co., Newark, N. J..... 434
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 432
R. D. Wood & Co., Philadelphia Pa..... 436
Stacey Mfg Co., Cincinnati, O..... 435
Western Gas Construction Co., Fort Wayne, Ind..... 440

PURIFYING MATERIALS.

Connelly Iron Sponge & Governor Co., New York City. 429
Greenpoint Chemical Works, Brooklyn, N. Y..... 412

VALVES.

Continental Iron Works, Brooklyn, N. Y..... 436
Davis & Farnum Mfg. Co., Waltham, Mass..... 432
Economical Gas Apparatus Construc'n Co, Toronto, Ont 413
Isbell-Porter Co., Newark, N. J..... 436
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 432
Ludlow Valve Manufacturing Co., Troy, N. Y..... 421
R. D. Wood & Co., Philadelphia, Pa..... 436
Stacey Mfg. Co., Cincinnati, O..... 435
The P. H. & F. M. Roots Co., Connersville, Ind..... 423
Western Gas Construction Co., Fort Wayne, Ind..... 440

EXHAUSTERS.

Connelly Iron Sponge & Governor Co., New York City.. 429
Connersville Blower Co., Connersville, Ind..... 417
Davis & Farnum Mfg. Co., Waltham, Mass..... 432
Isbell-Porter Company, Newark, N. J..... 436
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 432
The P. H. & F. M. Roots Co., Connersville, Ind..... 423

PURIFIER SCREENS.

John Cabot, Hoboken N. J..... 416
Western Gas Construction Co., Fort Wayne, Ind..... 440

GAS STOVES.

Albany Foundry Co., Albany, N. Y..... 433
American Meter Co., New York and Philadelphia..... 439
American Stove Co., Cleveland, O..... 328
Keystone Meter Co., Royersford, Pa..... 438
Maryland Meter & Manufacturing Co., Baltimore, Md.. 438
Nathaniel Tufts Meter Co., Boston, Mass..... 438

HOT WATER HEATERS.

Humphrey Co., Kalamazoo, Mich..... 419

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N. Y..... 424

GASHOLDERS.

Bartlett, Hayward & Co., Baltimore, Md..... 433
Continental Iron Works, Brooklyn, N. Y..... 424
Cruse-Kemper Co., Philadelphia, Pa..... 418
Davis & Farnum Mfg Co., Waltham, Mass..... 432
Delly & Fowler, Philadelphia, Pa..... 434
Economical Gas Apparatus Construc'n Co., Toronto, Ont 413
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 432
Logan Iron Works, Brooklyn, N. Y..... 436
R. D. Wood & Co., Philadelphia, Pa..... 434
Riter-Conley Mfg. Co., Pittsburgh, Pa..... 435
Stacey Mfg. Co., Cincinnati, O..... 435
Western Gas Construction Co., Fort Wayne, Ind..... 440

STORAGE TANKS.

Davis & Farnum Mfg. Co., Waltham, Mass..... 432
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 432
Stacey Mfg Co., Cincinnati, O..... 435
Western Gas Construction Co., Fort Wayne, Ind..... 440

PAINTS.

American Standard Composition Co., New York City.. 419

PATENTS, TRADE-MARKS, COPYRIGHTS.

Royal E. Burnham, Washington, D. C..... 416

THE ECONOMICAL GAS APPARATUS CONSTRUCTION COMPANY, LIMITED,

Consulting Engineers.

Builders of UP-TO-DATE Machinery and Appliances for Coal and Water Gas Plants. :: :: :: :: ::

PLANS, SPECIFICATIONS AND ESTIMATES PREPARED.

AMERICAN OFFICE:

269 Front St., East, Toronto, Canada.

ARTHUR E. BOARDMAN, C.E.,

For several years associated with the late CAPTAIN WILLIAM HENRY WHITE,

WILL CONTINUE THE BUSINESS OF

CONSULTING ENGINEER

For Gas, Water and Electric Light Companies, at

No. 41 Wall Street, Room 1707, New York.

TELEPHONE, 5534 BROAD.

SCIENTIFIC BOOKS.

MODERN APPLIANCES IN GAS MANUFACTURE. By Fletcher W. Stevenson. $2.

MODERN GAS ENGINES AND PRODUCER GAS PLANTS. By R. E Mathot. $2.50.

COAL TAR AND AMMONIA. By George Lunge. $15.

ELECTRIC GAS LIGHTING. By H. S. Norrie. 50 cents.

GAS ANALYST'S MANUAL. By J. Abady. $6.50.

COX'S GAS FLOW COMPUTER. $2.50.

THE "GAS WORLD" YEAR BOOK, 1906. Edited by John Douglas. $3.

GAS AND GAS WORKS. By Hughes and O'Connor. $2.40

POOLE ON FUELS. By Herman Poole. $3.

GAS ENGINEER'S POCKET-BOOK. By Henry O'Connor $3.50.

TECHNICAL GAS ANALYSIS. By Winkler & Lunge. $4.

GAS CONSUMER'S HANDYBOOK, by Wm. Richards. 20 cents.

PRACTICAL TREATISE ON HEAT. By Thomas Box. 2d edition. $5.

PRACTICAL PHOTOMETRY: A Guide to the Study of the Measurement of Light. By W. J. Dibdin. $3.

CHEMICAL TECHNOLOGY: Vol. I., *Fuel and Its Applications*, $5. Vol. II., *Lighting*, $4.

IRONWORK: Practical Designing of Structural Ironwork. By H. Adams. $3.50.

SELF-INSTRUCTION FOR STUDENTS IN GAS MANUFACTURE. Elementary, advanced and constructional, each, $1.50.

LIQUID FUEL FOR MECHANICAL AND INDUSTRIAL PURPOSES. By E. A. Brayley Hodgetts. $2.50.

HEMPEL'S GAS ANALYSIS, $2.25.

HANDBOOK FOR GAS ENGINEERS AND MANAGERS. Seventh edition. By Thomas Newbigging $6.50.

GAS, GASOLINE AND OIL ENGINES. By Gardner D. Hiscox. Fifteenth edition. $2.50.

PRACTICAL HANDBOOK ON GAS ENGINES, by G. Lieckfeld. $1.

HEAT A MODE OF MOTION. By John Tyndall. $2.50.

THEORY OF HEAT. By J. Clerk-Maxwell. $1.50.

MANUAL FOR GAS ENGINEERING STUDENTS. By D. Lee. 40 cents.

AMMONIA AND AMMONIUM COMPOUNDS. By Dr. R. Arnold. $2.

A TREATISE ON THE COMPARATIVE COMMERCIAL VALUES OF GAS COALS AND CANNELS. By D. A. Graham. $3.

A TEXT BOOK OF INORGANIC CHEMISTRY. By Prof. Victor Von Richter. $2.

ILLUMINATING AND HEATING GAS. By W. Burns. $1.50

HANDBOOK FOR MECHANICAL ENGINEERS. By H. Adams. $2.50.

GAS ENGINEER'S LABORATORY HANDBOOK. By Jno. Hornby. $2.50.

FINANCES OF GAS, ELECTRIC LIGHT AND POWER ENTERPRISES. By Wm. D. Marks. $2.50.

PRACTICAL PLUMBING. By P. J. Davies. Vol. I. $3, Vol II $4.50.

AMERICAN SANITARY PLUMBING. By James J. Lawler. $2.

FIELD'S ANALYSIS, 1904. $5.

TREATISE ON MASONRY CONSTRUCTION. Baker. $5.

A COMPARISON BETWEEN THE ENGLISH AND FRENCH METHODS OF ASCERTAINING THE ILLUMINATING POWER OF COAL GAS. $1.60.

ELECTRICITY.

INDUSTRIAL PHOTOMETRY, with Special Application of Electric Lighting. By A. Palaz, Sc.D. $4.

ELEMENTS OF ELECTRIC LIGHTING, Including Electric Generation, Measurement, Storage and Distribution. By Philip Atkinson. $1.50.

ELECTRIC TRANSMISSION OF ENERGY. By G. Kapp. $3.50.

ELECTRICIAN'S POCKET-BOOK. By Monroe and Jamieson. $2.50.

DYNAMO BUILDING. By F. W. Walker. 50 cents.

DOMESTIC ELECTRICITY FOR AMATEURS. By E. Hospitalier. $2.50.

PRACTICAL MANAGEMENT OF DYNAMOS AND MOTORS. $1.

PRACTICAL GUIDE TO THE TESTING OF INSULATED WIRES AND CABLES. $1.

ELECTRIC LIGHTING, by Francis B. Crocker. $3.

ELECTRIC LIGHT FITTING. $2.

PRACTICAL ELECTRICITY. $2.50.

ELECTRICITY FOR ENGINEERS. $2.50.

ELECTRICITY, Its Theory, Sources and Applications. By John T. Sprague. $6.

The above will be forwarded upon receipt of price. If sent by mail or express, postage or express charges must be added to above prices. We take especial pains in securing and forwarding any other Works that may be desired, upon receipt of order. All remittances should be made by check, draft, or post office money order. No books sent C.O.D.

A. M. CALLENDER & CO., 42 PINE ST., NEW YORK.

H. M. Byllesby & Company

(Incorporated),

GAS ENGINEERS,

DESIGN, CONSTRUCT AND OPERATE COMPLETE COAL, WATER AND CRUDE OIL GAS PLANTS.

HIGH AND LOW PRESSURE DISTRIBUTING SYSTEMS.

171 LA SALLE STREET,

CHICAGO.

The "Gas World" Year Book, 1906,

Edited by JOHN DOUGLAS.

Technical Data, Diary and Handy Tables for Gas Engineers and Managers, Directory of English Gas Companies, Analyses of Accounts of Gas Undertakings, etc.

Price, $3. For Sale by

A. M. CALLENDER & CO., - 42 Pine Street, New York City.

THE SEVENTH EDITION, ILLUSTRATED,

— OF THE —

Handbook for Gas Engineers and Managers,

By THOMAS NEWBIGGING, M. INST. C.E.

This Edition of the "Handbook for Gas Engineers and Managers" is a great improvement on all previous editions. Much of the text has been re-written, in order to keep the work abreast of the constant advances that are being made in the Gas Industry.

PRICE, - $6.50.

A. M. CALLENDER & CO., 42 Pine Street, New York City.

HUMPHREY

Nickel Cylinder Lamps,

Used either with or without shades. Supplied with round or pear globes. :: ::

Just the lamp to offer the hesitating consumer who wants a different design.

SHIPMENTS MADE FROM

Kalamazoo, Mich.
530 Market St., San Francisco.
46 West Broadway, New York.

General Gas Light Co.

COAL TAR AND AMMONIA.

THIRD AND ENLARGED EDITION.

BY

GEORGE LUNGE, PH.D.

Price, $15. For Sale by

A. M. CALLENDER & CO., - - 42 Pine Street, New York City.

PRACTICAL PHOTOMETRY,

A GUIDE TO THE STUDY OF THE MEASUREMENT OF LIGHT.

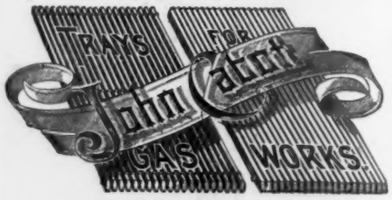
By WILLIAM JOSEPH DIBDIN.

With Numerous Illustrations. Price, $3.00.

A. M. CALLENDER & CO., No. 42 Pine Street, New York City.

E. PLANTINGA PRES. W.E. STEINWEDELL SEC.
THE
GAS MACHINERY
CO.,
MAIN OFFICE AND SHOPS
CLEVELAND, O.
N.Y. OFFICE, 56 PINE ST
J.A. MAYERS
REPRESENTATIVE
COAL & WATER GAS
APPARATUS;
PURIFIERS, VALVES,
CONNECTIONS,
ROTARY SCRUBBERS,
WASHERS,
BY PRODUCT MACHINERY.
COMPLETE GAS PLANTS.

PATENTS, TRADE MARKS, COPYRIGHTS.
ROYAL E. BURNHAM,
Solicitor of Patents and Counsellor in Patent Causes.
833 Bond Building, Washington, D. C
Send for Pamphlet on Patents.
1418-tf

Church's Patent Trays.
Reversible; Strongest; Most Easily Repaired.
Special Trays for Iron Sponge.


1412-1416 Adams Street, Hoboken, N. J.
We also Supply the Cheapest and Strongest
•Reversible Bolted Trays•
IN THE MARKET.
SEND FOR BOOKLET AND CIRCULARS.

PRACTICAL PHOTOMETRY,
By WILLIAM JOSEPH DIBDIN,
PRICE, $3. FOR SALE BY
A. M. CALLENDER & CO., 42 Pine Street, New York City.

Bristol's Recording
PRESSURE GAUGE.
For continuous records of Street Gas Pressure.
Simple in construction, accurate in operation and low in price.
Fully Guaranteed. Send for Catalog A.
THE BRISTOL CO.,
Waterbury, Conn.
Gold Medal, St. Louis Exposition.

THE BEST are THE CHEAPEST.
HOMOGENEOUS CONSTRUCTION ~ PERFECT FINISH ~ LONGEST CONTINUOUS LIFE.
WE HAVE RETORTS MAKING GAS TO-DAY THAT HAVE BEEN IN CONSTANT USE FOR 52 MONTHS.
Awarded the Only GRAND PRIZES At St. Louis Exposition
BY A JURY COMPOSED OF THE MOST COMPETENT ENGINEERS OF FOUR CONTINENTS, FOR SUPERIOR
RETORTS * GAS BENCHES * FIREBRICK.
Designs and Estimates Cheerfully Furnished.
LACLEDE FIREBRICK MANUFACTURING COMPANY,
ST. LOUIS, MO.

WHY DO GAS EXHAUSTERS

AND HIGH PRESSURE GAS PUMPS BUILT BY

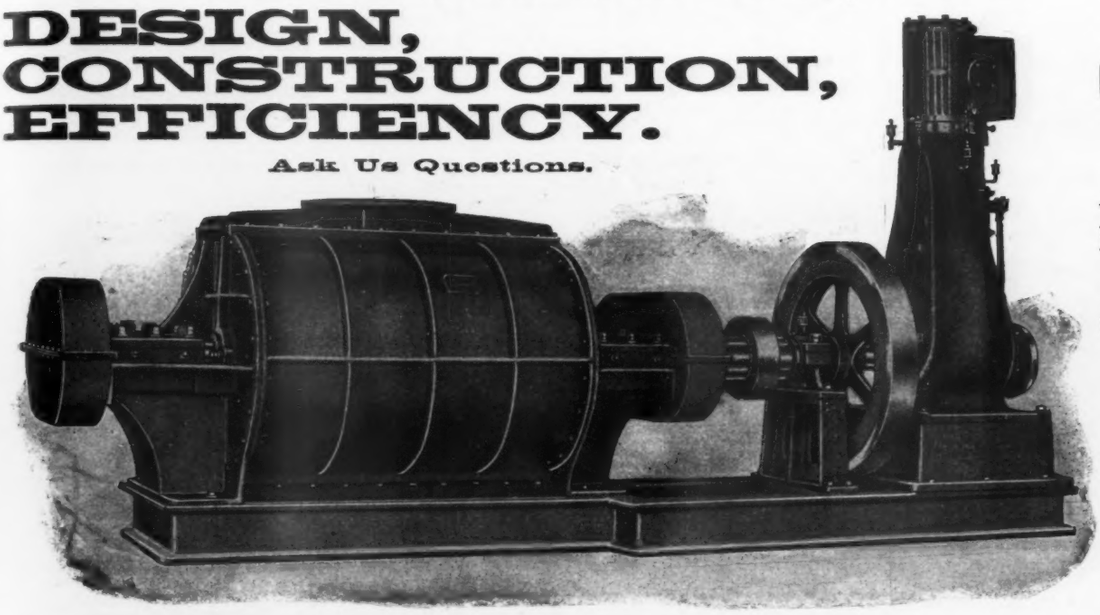
THE CONNERSVILLE BLOWER CO.

Stand so High in the estimation of those using them?

THE ANSWER IS IN THREE WORDS:

DESIGN, CONSTRUCTION, EFFICIENCY.

Ask Us Questions.



Home Office:
CONNERSVILLE, IND.

Eastern Sales Agent:
HORACE G. COOKE,
95 Liberty Street, New York City.

Write us about our Improved Stuffing Boxes.

Something Entirely New.

Gas Analyst's Manual,

By JAQUES ABADY, M. Inst. Mech. E.

(Incorporating F. W. Hartley's "Gas Analyst's Manual" and "Gas Measurement.")

Ninety-three Illustrations and Nine Folding Plates.
Bound in Handsome Half Leather. Price, - $6.50.

FOR SALE BY

A. M. CALLENDER & CO., - - 42 Pine Street, New York City.

POOLE ON FUELS.

THE CALORIFIC POWER OF FUELS.

WITH A VERY FULL COLLECTION OF TABLES OF HEATS OF COMBUSTION OF FUELS, SOLID, LIQUID AND GASEOUS.

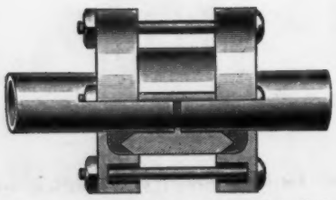
TO WHICH IS ALSO APPENDED

THE REPORT OF THE COMMITTEE ON BOILER TESTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, DECEMBER (1897); TABLES OF CONSTANTS USED.

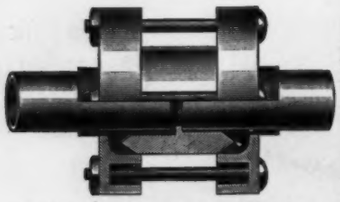
By HERMAN POOLE, F.C.S.

Second Edition. Price $8. For Sale by

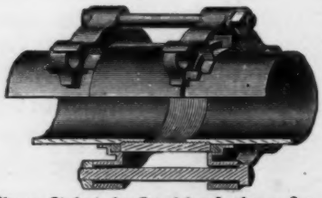
A. M. CALLENDER & CO. - - No. 42 Pine Street, New York City.



Regular Coupling, Style 1, for Plain End Wrought Iron Pipe.



Insulating Coupling, Style 5, for Plain End Wrought Iron Pipe,



Clamp, Style 4, for Repairing Leaks on Screw Collar.

Long Sleeve, Style 2, for Mending Broken Lines.

S. R. DRESSER MANUFACTURING CO.,

SUCCESSORS TO

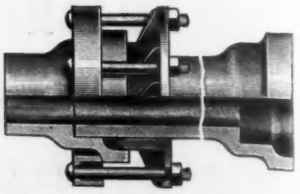
S. R. DRESSER,

BRADFORD, PA., U. S. A.,

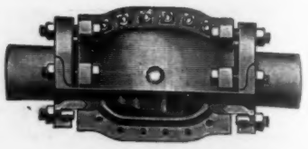
Patentee and Manufacturer of Specialties for Gas and Water Lines,

Pipe Couplings, Sleeves, Clamps, Crosses, Tees and Ells.

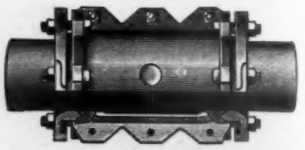
STATE REQUIREMENTS AND SEND FOR CATALOGUE.



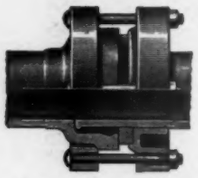
Coupling, Style 9, for Special Style Cast Iron Pipe.



Split Sleeve for Repairing Broken Bell on Cast Iron Pipe.



Split Sleeve for Repairing Broken or Cracked Cast Iron Pipe.



Clamp, Style 4½, for Repairing Leaky Lead or Cement Joints in Cast Iron Pipe.

MAIN AND SERVICE LAYING.

Gas and water companies about to lay new mains or services will find it useful to communicate with us. Our gangs are experienced and our plant is completely equipped for street main and service laying in all branches. These are our specialties. We are in a position to quote prices which will attract the attention of the economical manager.

Gas Company References. Correspondence Solicited.

Telephone, 302 Flushing. SULLIVAN BROS., Flushing, N. Y.

ELECTRIC GAS LIGHTING.

How to install electric gas igniting apparatus, including the jump spark and multiple systems for use in houses, churches, theaters, halls, schools, stores or any large building. Also, the care and selection of suitable batteries, wiring and repairs.

By H. S. NORRIE.

Price, 50 cents. Orders may be sent to

A. M. CALLENDER & CO., 42 PINE ST., N. Y. CITY.

FIELD'S ANALYSIS

For the Year 1904.

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 36th Year of Publication.

COMPILED AND ARRANGED BY JOHN W. FIELD,

Secretary and General Manager of The Gas Light and Coke Company, London.

PRICE, $5. FOR SALE BY

A. M. CALLENDER & CO., 42 PINE ST., NEW YORK CITY.

THE AMERICAN STANDARD COMPOSITION CO.

—) MANUFACTURES (—

HEAT PROOF AND DAMP PROOF PAINTS

For Structural Iron and Steel, Gas Apparatus, Underground Piping, Boiler Fronts, Stacks, etc.

Our Paints will not crack, peel or scale. Heat does not affect them. They are moisture proof.

They are the Paints that Don't Come Off!

We let you Try before you Buy. Send for samples and prices.

AMERICAN STANDARD COMPOSITION COMPANY,

1707, Wall Street Exchange Building, New York.

FOR HOT BATHS,

And for every other Hot Water Need, use the

IMPROVED

HUMPHREY CRESCENT INSTANTANEOUS WATER HEATERS.

Efficient. Compact. Durable. Every Heater Guaranteed.

No. Heater.	Price.	Gas Supply from Meter.	Heats Gals. per Min. 50° in Temperature.	Height.	Diameter.	Shipping Weight.
Non-Contact 2	$40 00	¾ Inch.	2½	34⅝ Inches.	12 Inches.	70 Pounds.
" 1	34 00	¾ "	2	31 "	10¾ "	62 "
Contact 6	24.00	¾ "	3	28½ "	13 "	60 "
" 8	23.50	¼ "	2½	28½ "	10¼ "	48 "
" 9	20.00	⅝ "	1	24 "	9¼ "	45 "

These prices include Safety Valves and Unions, one Bent Output Spout. For prices of fittings see our complete catalogue, "The Luxury of a Bath."

We will be glad to quote discounts.

HUMPHREY CO., · · · Kalamazoo, Mich.

The ONLY manufacturers in the world of a complete line of Instantaneous Water Heaters.

J. F. W. JOST,

CHEMICAL ENGINEER

—IN—

GAS MANUFACTURE,

P. O. BOX 2047, PHILADELPHIA PA.

Catalogue 0416 contains illustrations and full details of plants we have installed. We shall be pleased to forward a copy on request.

HUNT CABLE RAILWAY

C. W. HUNT COMPANY,
West New Brighton, New York.

Gas Engineer's Pocket-book, HENRY O'CONNOR.

—BY—

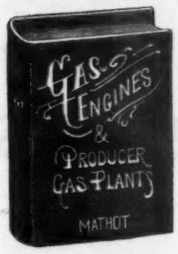
Comprising Tables, Notes and Memoranda relating to the Manufacture, Distribution and Use of Coal Gas, and the Construction of Gas Works. PRICE, $3.50. For Sale by

A. M. CALLENDER & CO., 42 Pine St., N.Y. City.

MODERN GAS ENGINES and PRODUCER GAS PLANTS,

By R. E. MATHOT, M.E.,

Containing a Preface by DUGALD CLERK, F.C.S, indorsing the Book.



☞ A practical treatise of 320 pages, fully illustrated by 175 detail illustrations, setting forth the principles of gas engines and producer design, the selection and installation of an engine, conditions of perfect operation, producer gas engines and their possibilities, the care of gas engines and producer gas plants, with a chapter on volatile hydrocarbon and oil engines.

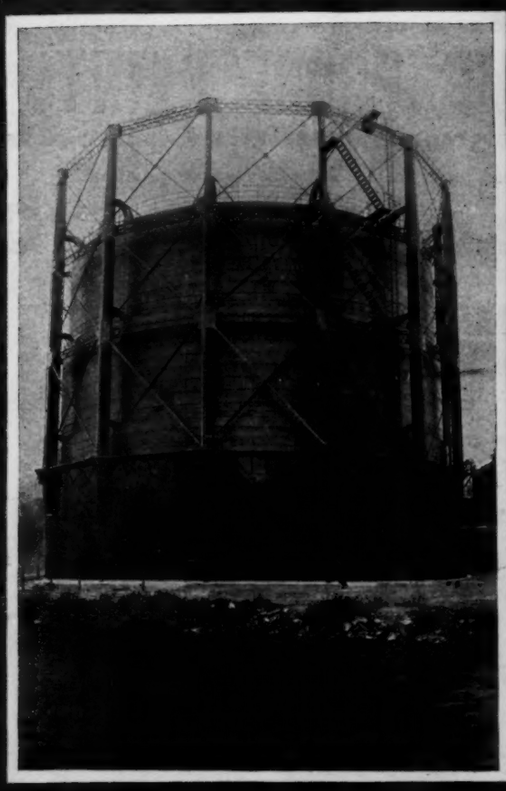
PRICE, $2.50. For Sale by

A. M. CALLENDER & CO, - 42 Pine Street, New York City.

PRACTICAL HANDBOOK ON GAS ENGINES, WITH INSTRUCTIONS FOR CARE AND WORKING OF THE SAME.

By G. LIECKFELD, C.E. Translated with Permission of the Author, by GEO. M. RICHMOND, M.E. Price, $1.00.

A. M. CALLENDER & CO., 42 PINE ST., NEW YORK CITY.



ARTHUR R. CRUSE
President

A. E. KEMPER
Treasurer

HENRY W. SCATTERGOOD
Vice-President

FRANK FLAVELL
Secretary

CRUSE-KEMPER COMPANY

PHILADELPHIA OFFICES
1205-6 Stephen Girard Building

WORKS
Ambler, Pa

Manufacturers of

TRIPLE
DOUBLE and
SINGLE-LIFT

Gas Holders

WITH OR WITHOUT
METAL TANKS

Oil and Water Tanks
Purifier Covers
General Plate Metal Work and
Steel Water Towers

PLANS, SPECIFICATIONS AND ESTIMATES
PROMPTLY FURNISHED ON REQUEST

FRANK D. MOSES,

Telephone, 204-A — TRENTON, N. J., — Telephone, 204-A

Constructing Engineer and Contractor.

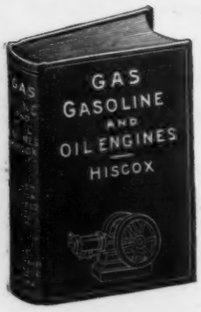
Estimates Furnished on any kind of Work in Connection with Gas or Water Plants.

SPECIAL ATTENTION GIVEN TO THE REMODELLING AND EXTENDING OF THE PROPERTIES OF WORKS NOT UP-TO-DATE.

CORRESPONDENCE SOLICITED.

Gas, Gasoline and Oil Engines,

INCLUDING GAS PRODUCER PLANTS.



By GARDNER D. HISCOX, M.E.,

Author of "MECHANICAL MOVEMENTS," "COMPRESSED AIR," Etc.

Fifteenth Edition. Revised, Enlarged and Reset.

PRICE, $2.50. For Sale by

A. M. CALLENDER & CO., - - 42 Pine Street, New York City.

LOW PRICE BURNERS

COST MOST IN THE END.

Don't allow yourself to be deceived into believing that some other makes of burners are cheap simply because they cost less than

BRAY BURNERS.

They may cost less than the Bray and they may look like the Bray, but trouble will follow their installation To avoid this, see that such burners as you use are stamped with Bray's Trade Mark.

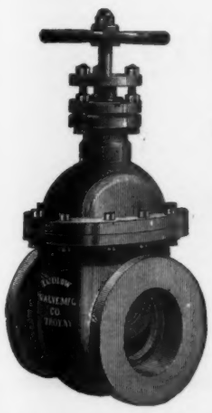
FOR FORTY YEARS

Bray Burners have been and are to-day the leading and accepted choice of the largest Gas Companies. Our Blue Book tells you why. Send for it.

W. M. CRANE COMPANY,

1131-33 Broadway, New York, N. Y.,

Makers of all kinds of Gas Appliances.



THE

Ludlow Valve Mfg. Co.,

TROY, N. Y., U. S. A.

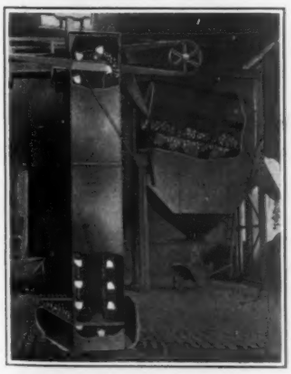
Double and Single Gate Valves, ¼" to 72",

—FOR—

Gas, Water, Steam, Oil, Ammonia, Etc.

HOT GAS VALVES A SPECIALTY.

Send for Catalogue.



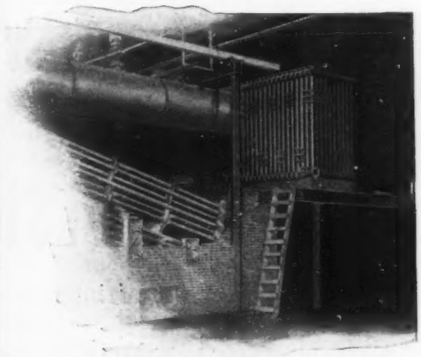
Reclaiming Coke from Ashes.

The Link-Belt elevating, conveying and screening outfit here shown is in use by the Mutual Gas Light Co., New York City. Write to us for full description of this and other Link Belt machinery successfully applied to gas house use.

THE LINK-BELT ENGINEERING CO.,

PHILADELPHIA.

NEW YORK: 49 Dey St. PITTSBURGH: Park Building. CHICAGO: The Link-Belt Machinery Co.



Even where coal costs only 25c. per ton the Green Fuel Economizer is a Profitable Investment.

A large number of our Economizers have been installed in the very heart of the coal fields and at the mines themselves, as at the Hampton Mines of the D., L. & W. R. R., at Scranton, Pa In mine boiler plants only the poorest coal is used, so that its cost is practically only the cost of handling, the better coal being sent to market. Still, with this exceedingly cheap fuel, the Economizer is made to pay a good rate of interest on the investment. This is attested by the large number of such orders that we have received from Mining Companies w o have expert engineers to look into the matter. Such being the case, how profitable will the investment be where coal costs $3 to $5 per ton? We can show instances where the yearly saving is considerably over 40 per cent. of the first cost of the Economizer, and if you will send us the main dimensions of your plant and the working conditions, we shall be pleased to make a detailed estimate of the saving that would be realized if you should install an Economizer.

Economizer surface costs less than one-third as much as boiler surface, and is as efficient in transmitting heat, as it is kept clean by automatic scrapers, and the temperature of the contained water is lower than the temperature of the water in the boiler. When the Economizer is used the temperature of the flue gases is usually considerably lower than the temperature of the steam, which is manifestly impossible of accomplishment by the boiler alone. The Economizer also reduces the expense of boiler cleaning and repairs, as it precipitates many of the impurities in the water.

Write for Book AG on Steam Plant Economy, and ask also for our Catalog of Fans, Blowers and Exhausters.

The Green Fuel Economizer Co., Matteawan, N. Y.

(Sole Builders in this Country.)

EMPIRE GAS IMPROVEMENT AND CONSTRUCTION CO.,

Contractors for the Installation of

COMPLETE GAS WORKS OR ANY PART THEREOF, INCLUDING

Houses, specially designed for room and economy.
Holders of any desired capacity, with or without Steel Tank.
Coal Gas Benches of every approved setting.

Standard Lowe Double Superheater Water Gas Sets.
Lowe-Sutherland Double Superheater Water Gas Sets.

Boilers, Engines, Blowers, Coal Elevators, Purifying Boxes, Tar Extractors, Scrubbers, Condensers, Exhausters, Station Meters, Street Mains and Governors.

Where necessary we give Bond in any required sum to guarantee speedy *completion* and *results.*

EMPIRE GAS IMPROVEMENT AND CONSTRUCTION CO., 49 Wall St., New York.

NEW DESIGNS FOR THE NEW SEASON.

Is it of interest to you to know that your dip pipes are all sealed absolutely the same?
That you can lock up your air slides and put the key in your pocket?
That your retorts carry none of the weight of your mouthpieces?
These advantages and many more are embodied in our

BENCH IRONWORK.

LLOYD CONSTRUCTION COMPANY,

DETROIT, MICH.

Western Agents
BARTLETT, HAYWARD & CO., Baltimore, Md.

MUELLER PIPE REAMERS.

RATCHET HANDLE PATTERN.

C—035.

The only way to invariably have a pipe reamer of the right size in your kit when you go out on a job is to use the kind that has all sizes in one.

The Mueller Pipe Reamer is made to ream all sizes of pipe from three-eighth to 3-inch, and it requires no adjustment to get it ready for the different pipe sizes. With one in your kit you are always sure of having any size you might need on a job.

Mueller Pipe Reamers have the blades made of good tool steel and well relieved to prevent dragging. They are made in plain handle and ratchet handle patterns. The reamer illustrated is ratchet handle pattern.

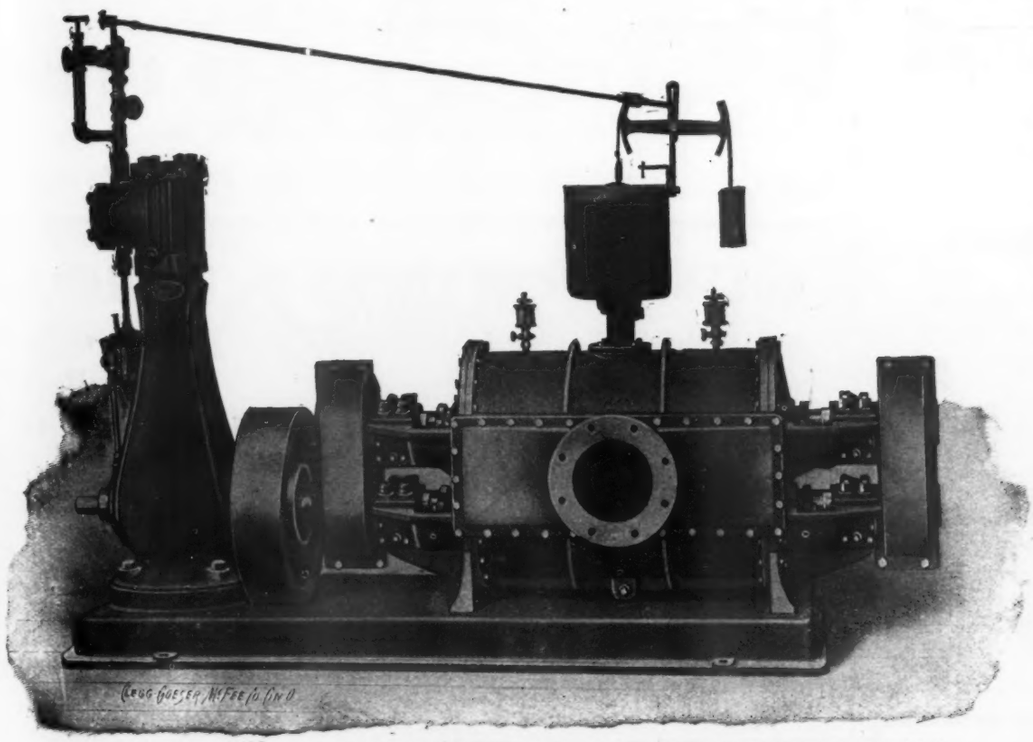
Each reamer is carefully inspected and assembled, is given an actual working test, bears the Mueller trade mark, and is *unconditionally guaranteed*. We also make tapping machines and a full line of gas cocks and meter connections for gas works' use. Catalogs upon request.

H. MUELLER MFG. CO.

Works and General Offices
DECATUR, ILL., U. S. A.
West Cerro Gordo St.

Eastern Division
NEW YORK, N. Y., U. S. A.
254-258 Canal St. (Cor. Elm)

ROOTS' GAS EXHAUSTERS.



GOLD MEDAL AT ST. LOUIS, 1904.

Sizes for any required capacity.

Self-oiling, adjustable bronze bearings.

Most perfect and sensitive Governor.

Write for Catalogue.

P. H. & F. M. ROOTS COMPANY,

HOME OFFICE:
Connersville, Ind.

NEW YORK OFFICE:
120-122 Liberty St.

CHICAGO OFFICE:
1547 Marquette Bldg.

TWENTIETH SERIES

ARGAND

GAS RANGE.

A CAST FRONT RANGE.

Beautifully Ornamented.
All Ovens 12 inches high.
Centrifugal Burners.
Extra heavy ¼-inch Gas Rails.

GIVE US PERMISSION TO SUBMIT A SAMPLE.

Albany Foundry Company,

Manufacturers of the Argand Line of Gas Appliances,

Albany, N. Y.

PHILADELPHIA BRANCH:

HEATH STOVE REPAIR CO., Managers, 136-138 North 2d St.

No. 20-16 and 20-18 Argand Range.

DIMENSIONS.

Depth of top,	24 inches.
Width of top, including two shelves,	38 "
Height of Range,	24 "

GEORGE ORMROD, Mangr. & Treas., Emaus, Pa.
JOHN DONALDSON, Prest., Betz Bldg., Phila., Pa.

EMAUS PIPE FOUNDRY.

DONALDSON IRON COMPANY. EMAUS, PA.

MANUFACTURERS OF

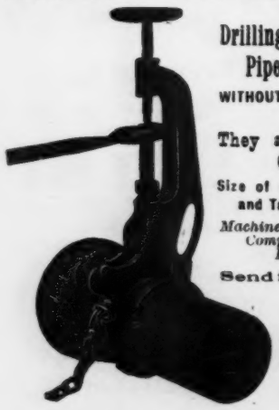
CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

Also, FLANGE PIPE, LAMP POSTS, Etc.

GAS TAPPING MACHINES

—FOR—



Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

Send for Circulars.

Geo. Light,
DAYTON, O.

MUELLER GAS MAIN TAPPING MACHINE.

The Mueller "Swivel No. 1," "Swivel No. 2" and "Swivel No. 3" Tapping Machines are made especially for tapping gas mains under pressure. They are made extra heavy in all parts, have extra long ratchet sweep and can be adjusted to any angle or corner of the ditch. The No. 1 taps up to 2-inch, the No. 2 up to 3 inch and the No. 3 up to 4-inch. The "Century" makes taps from ¼ to 1 inch in high pressure mains. Unconditionally guaranteed Catalogues upon application.

C-1004.

H. MUELLER MFG. CO.,
Decatur, Ill., U. S. A. New York, N. Y., U. S. A.

"THE MINER"
Globe Street and Boulevard Lamps.

Cheapest and Best

THOUSANDS IN USE WITH INCANDESCENT BURNERS.

Send for Catalogues.

THOMAS T. W. MINER,
821-823 Eagle Av., N.Y.

GASHOLDER TANKS AND GAS WORKS MASONRY COMPLETE.

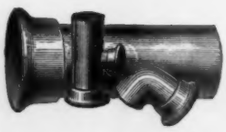
Plans prepared and Estimates furnished at short notice.

J. P. WHITTIER,
238 Java Street, Brooklyn, N. Y.

WARREN FOUNDRY AND MACHINE CO.,

Established 1856. Works at Phillipsburgh, N. J.

New York Office, 160 Broadway.



CAST IRON WATER AND GAS PIPE,

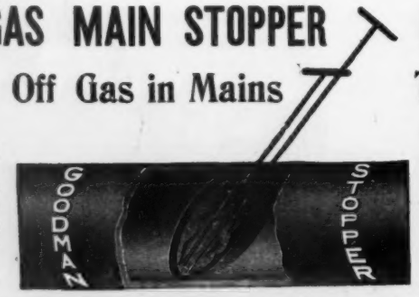
FROM THREE TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

Flange Pipe for Sugar House and Mine Work. Branches, Bends, Retorts, etc., etc.

SAFETY GAS MAIN STOPPER COMPANY,

For Shutting Off Gas in Mains

Any size gas main can be shut off in 30 seconds. : : :

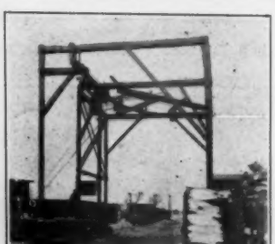


Temporarily during alterations and repairs. : : : :

STOPPERS SENT ON TRIAL.

Address: SAFETY GAS MAIN STOPPER CO., 1668 Park Ave., New York City.

TELPHER CARRYING COAL



from cars to storage at plant of the Rome Gas Light Co., Rome, N. Y. *Capacity of hoist,* 2,500 *pounds;* its speed, 60 feet a minute; conveying speed, 600 feet a minute. Timber construction spans railroad track and public street, preventing obstruction to travel.

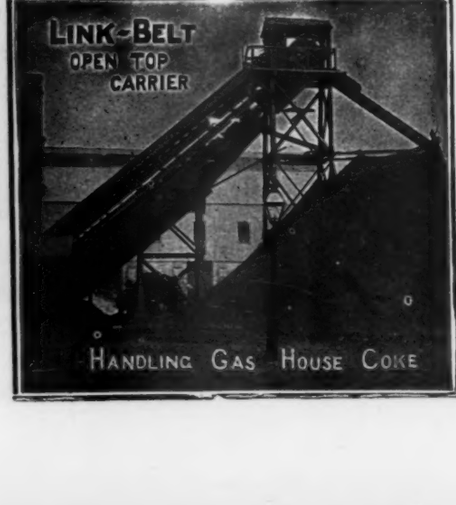
Write for Booklet 53.

UNITED TELPHERAGE DEPARTMENT
The Dodge Coal Storage Co.

PHILADELPHIA—Hunting Park ave. & P. & R. Ry.
NEW YORK—49 Dey street.
BOSTON—161 Federal street
CHICAGO—9th street and Stewart avenue.
PITTSBURGH—1501-2 Park Building.
PORTLAND, ORE.—309 McKay Building.

Chollar's System of Gas Purification.

THE PURIFIED GAS REVIVES THE FOULED OXIDE.



LINK-BELT

OPEN TOP CARRIER.

ESPECIALLY ADAPTED FOR HANDLING

Coal, Coke, Ashes, Stone, Ores,

Or any heavy or gritty materials, where strength and durability are essential. Constructed in any length or capacity, and to suit local conditions.

WRITE FOR CATALOG

The Link-Belt Machinery Co.
Link-Belt Engineering Co. Philadelphia Chicago, U.S.A.

AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

MARCH, 1906.

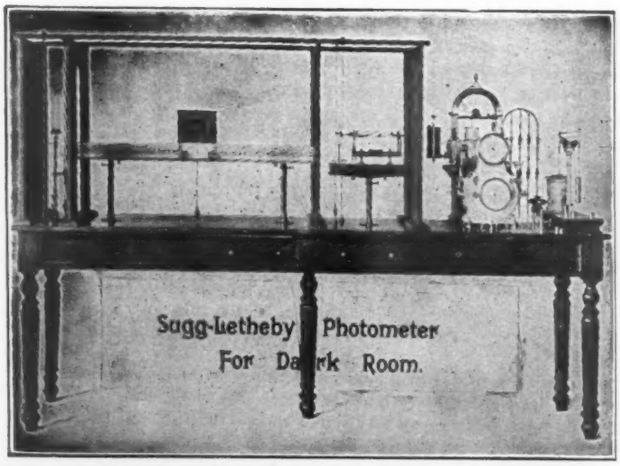
Table No. 1.
FOLLOWING THE MOON.

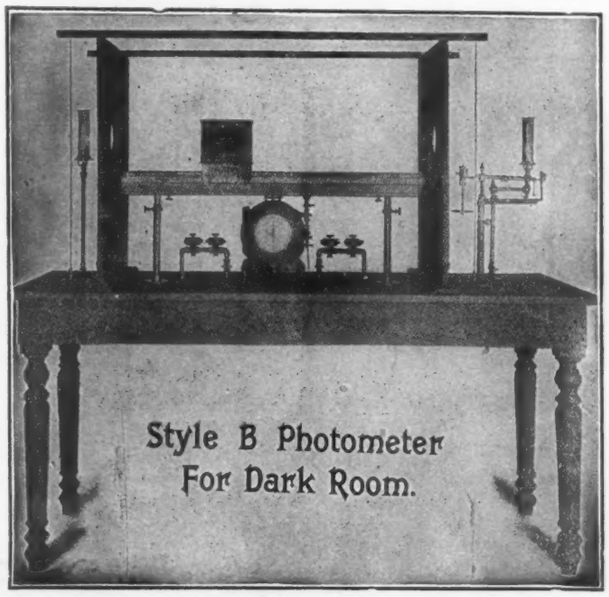
Day of Week.	Date.	Light.	Extinguish.
Thu.	1	11.00 PM	5.40 AM
Fri.	2	12.00 FQ	5.40
Sat.	3	12.50 AM	5.40
Sun.	4	1 40	5 30
Mon.	5	2.30	5.30
Tue.	6	3.20	5.30
Wed	7	4.00	5.30
Thu.	8	4.40	5 30
Fri.	9	No L.	No L.
Sat.	10	No L. FM	No L.
Sun.	11	No L.	No L.
Mon.	12	6.30 PM	9.20 PM
Tue.	13	6.30	10.30
Wed.	14	6.30	11.40
Thu.	15	6.30	12.50 AM
Fri	16	6.30 LQ	2.00
Sat.	17	6.30	3.00
Sun	18	6 40	3.50
Mon.	19	6.40	4.40
Tue.	20	6.40	5.00
Wed.	21	6.40	5.00
Thu.	22	6 40	5.00
Fri.	23	6.40	5.00
Sat.	24	6.40 NM	5.00
Sun.	25	6.50	4.50
Mon.	26	6 50	4.50
Tue.	27	6.50	4.50
Wed.	28	6.50	4.50
Thu.	29	9.50	4.50
Fri.	30	10.40	4.50
Sat.	31	11.30	4 50

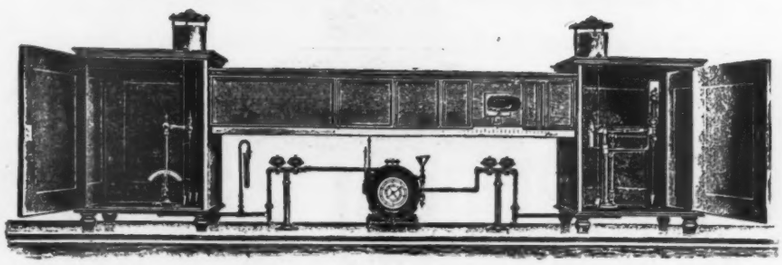
TOTAL HOURS DURING 1906.

By Table No. 1.

	Hrs.Min.
January	223.40
February	190.40
March	192.10
April	167.00
May	152.20
June	142.10
July	150.20
August	157.40
September	170.00
October	185.10
November	201.40
December	214.00
Total, yr.	2146.50







Closed Photometer For Light Room.

CIRCULARS SENT ON REQUEST.

PUBLIC LIGHTING TABLE.

MARCH, 1906.

Table No. 2.
NEW YORK CITY.
All Night Lighting.

Day of Week.	Date.	Light.	Extinguish.
		P. M.	A.M.
Thu.	1	5.30	5.45
Fri.	2	5.30	5.45
Sat.	3	5.30	5.45
Sun.	4	5.30	5.45
Mon.	5	5.40	5.35
Tue.	6	5.40	5.35
Wed.	7	5.40	5.35
Thu.	8	5.40	5.35
Fri.	9	5.40	5.35
Sat.	10	5.40	5.35
Sun.	11	5.40	5.35
Mon.	12	5.50	5.20
Tue.	13	5.50	5.20
Wed.	14	5.50	5.20
Thu.	15	5.50	5.20
Fri.	16	5 50	5.20
Sat.	17	5.50	5.20
Sun.	18	5.50	5.20
Mon.	19	6.00	5.10
Tue.	20	6.00	5.10
Wed.	21	6 00	5.10
Thu.	22	6.00	5.10
Fri.	23	6.00	5.10
Sat.	24	6.00	5.10
Sun.	25	6.00	5.10
Mon.	26	6.10	4.55
Tue.	27	6 10	4.55
Wed.	28	6.10	4.55
Thu.	29	6.10	4.55
Fri.	30	6.10	4.55
Sat.	31	6.10	4 55

TOTAL HOURS DURING 1906.

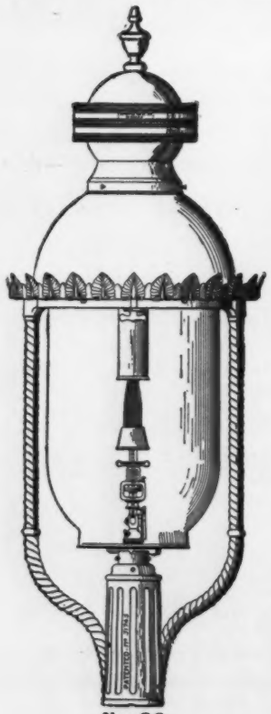
By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 318 West 42d Street. BOSTON, 820 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Roe Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 712 Polk Street.

WELSBACH STREET LIGHTING COMPANY

.... OF AMERICA ....



No. 36.

Controls and Operates the

Welsbach System of Street Lighting,

Which includes its specially DESIGNED AND PATENTED BURNER for STREET and PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

The Welsbach No. 6 Harp Fixture.

AN IDEAL LIGHT FOR DINING OR LIVING ROOMS.

THE HIGHEST MECHANICAL INGENUITY COMBINED WITH ORNAMENTAL BEAUTY--THE NEWEST OUTPUT FROM THE WELSBACH FACTORIES.

Equipped with new model No. 66 high candle power Welsbach Burner.

Side Pilot By-pass Tube covered with refractory sleeve to prevent bending.

Fourteen-inch Opal Dome Shade.

Polished Brass Embossed Crown 2¼ inches high.

Length of Fixture, 30 inches.

Width of Harp, 4½ inches.

Finished in Polished Brass.

Packed One Dozen to the Case.

List Price, per Dozen, $45 00.

We recommend equipping the No. 6 Harp Fixture with No. 4197 Intensive Brand Mantle, and the No. 306 **F. Q. M.** Clear Glass Air-Hole Cylinder.

Although the 14-inch Opal Dome Shade is standard equipment, we are prepared to furnish Dome Shades in green, pink or yellow (opal lined), and will be glad to quote prices.

WELSBACH CO.,

Salesrooms in all the principal cities of the United States.

Factories:

GLOUCESTER, N. J.

CHICAGO, ILL.

THE UNITED GAS IMPROVEMENT COMPANY

For the Year Ending December 31st, 1905, has been Awarded Contracts for 40 Sets of

Standard Double-Superheater Lowe Water Gas Apparatus.

PARTIAL LIST OF PLACES:

Catasauqua, Pa.
Plattsmouth, Neb.
Detroit, Mich. (2d contract).
Springfield, Ills.
Oneonta, N. Y. (2d contract).
Pottsville, Pa. (2d contract).
Evansville, Ind. (2d contract).
Lansdale, Pa.
Hempstead, N. Y. (2d contract).
New Britain, Conn.
New York, Mutual Co. (3d contract)
St. Louis, Mo. (4th contract).
Sioux City, Ia. (3d contract).
Amsterdam, N. Y.
Houston, Tex. (2d contract).
Hamilton, O. (2d contract).
Indianapolis, Ind. (2d contract).
Nanticoke, Pa.
Hazleton, Pa.
Mahanoy City, Pa.
Ludington, Mich.
Ossining, N. Y.
Lancaster, Pa.
Flushing, N. Y. (2d contract).
South Bend, Ind.
Fall River, Mass. (2d contract).
Minneapolis, Minn. (2d contract).

TOTAL SETS TO DECEMBER 31, 1905, ... 593
TOTAL DAILY CAPACITY TO DECEMBER 31, 1905, 463,780,000 CU. FT.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

J. H. Gautier & Co.

Greene & Essex Streets,
Jersey City, N. J.

MANUFACTURERS OF

CLAY GAS RETORTS, FIRE CLAY TILES, FIRE BRICK and FIRE CLAY SPECIALTIES.

Ground Fire Clay, Fire Sand and Ground Fire Brick in Barrels and Bulk.

SOLE MANUFACTURERS OF THE

FLEMMING GENERATOR GAS FURNACE

Brooklyn Fire Brick Works,

OFFICE AND WORKS:
88 VAN DYKE ST., BROOKLYN, N. Y.
MANUFACTURERS OF

CLAY GAS RETORTS & SETTINGS, GENERATOR LININGS. SPECIALTIES.

ST. LOUIS GAS CONSTRUCTION CO.,

DESIGNERS AND BUILDERS OF

COAL GAS BENCHES,

SPECIAL HIGH GRADE REFRACTORY MATERIAL FOR BENCH SETTINGS AND WATER GAS LININGS.

SOLE AGENTS FOR

CHRISTY SETTINGS.

CORRESPONDENCE SOLICITED.

ST. LOUIS, MO.

FIELD'S ANALYSIS FOR THE YEAR 1904.

An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 36th year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by
A. M. CALLENDER & CO., 42 Pine St., New York City.

ALBERT J. WEBER, President and General Manager.
Established 1846.

Adam Weber Sons.

Manhattan Fire Brick and Enameled Fire Clay Retort Works.

Works at Weber, on the Raritan River, Middlesex County, New Jersey.
GENERAL OFFICES:
Park Row Building, New York City.

Modern Coal Gas Benches,

With either Horizontal or Inclined Retorts, Half-Depth and Full-Depth Recuperative Furnaces.

ADAM WEBER PATENTS

STANDARD BENCH IRONWORK.

Linings for Water Gas Apparatus, High Grade Fire Brick of All Shapes and Sizes, Ground Fire Clay, Ground Fire Brick in Bulk or in Barrels.

ISAAC C. BAXTER, President.
Works,
LOCKPORT STATION, PA.

ESTABLISHED 1864.

JAMES GARDNER, JR., CO.,

Successor to WILLIAM GARDNER & SON.

PETER YOUNG, Secretary and Treas.
Address all communications to
JAMES GARDNER, JR., CO., Room 202 Lewis Bldg
PITTSBURGH, PA.

Fire Clay Goods for Gas Works.

HENRY MAURER & SON,

(ESTABLISHED 1856.)

EXCELSIOR FIRE BRICK & CLAY

RETORT WORKS

WORKS, Perth Amboy, N. J.
OFFICE, 418 to 422 East 23d St., N. Y.

Clay Gas Retorts,

BENCH SETTINGS,

Fire Brick, Tiles, Etc.

GEROULD'S IMPROVED RETORT CEMENT.

A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

Price List, f.o.b. PITTSBURGH, PA.

In Casks, 400 to 800 pounds, at 5 cents per pound.
In Kegs, 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

C. L. GEROULD,
1200 Bank for Savings Bldg., Pittsburgh, Pa.

NATIONAL PYROGRANIT COMPANY,

MANUFACTURERS OF

Fire Brick, Tiles, Special Shapes, etc.

NEW YORK OFFICE:
17 Battery Place, New York.

WORKS:
South River, N. J.

ESTABLISHED 1868.

L. N. RANCKE, Vice-Pres. & Mgr. F. SCHIAFFINO, Sec'y & Treas.

BALTIMORE RETORT & FIREBRICK CO.

BALTIMORE, MD.,

Manufacturers of all Material for the Construction of Coal Gas Benches.

HALF AND FULL DEPTH AND FREE FIRING BENCHES,

All styles of which we have in operation, equipped with the BEST of LATEST IMPROVEMENTS, proving our claim for SUPERIOR QUALITY and EFFICIENCY.

INCLINES—We have in SUCCESSFUL OPERATION benches of Inclined Retorts, MANUFACTURED and ERECTED by us.

WALDO BROS., 102 MILK ST., BOSTON, MASS.,
Agents for New England States.

LARGE FACILITIES—Correspondence Solicited.
RAIL and WATER CONNECTIONS to ALL POINTS.

JOHN DELL,
President and General Manager.

MISSOURI FIRE BRICK CO.,

ESTABLISHED 1882.

MANUFACTURERS OF

Gas Retorts, Bench Settings, Fire Brick, Cupola Linings, Etc.

We are the **Exclusive Agents** *for the* **Mitchell Patent Benches,** *Constructed with Half or Full Depth Furnaces, to Burn either Coal or Coke, and Arranged for Front or* **Rear Clinkering.** *The* **Mitchell** *is the* **Original Coal Firing Bench.** *We also Erect Plain Benches with* **One** *to* **Six Retorts.**

YOUR CORRESPONDENCE IS RESPECTFULLY SOLICITED.

City Office: *411 Olive Street, Continental Bank,* ST. LOUIS, MO.

Bronder Patent Stoking Machinery.

Three-Scoop and Three-Rake Charging and Discharging Machines are operating in New York, Newark, N. J., Philadelphia, Worcester, Mass., Mt. Vernon, N. Y., Toronto and Montreal, Canada.

Four-Scoop and Four-Rake Charging and Discharging Machines are operating in Detroit, Mich.

These are the only machines that will draw or charge simultaneously 3 or 4 retorts (vertically) and handle from 42 to 60 retorts in from 25 to 30 minutes, lid opening and closing and filling of furnaces included.

Hot Coke Conveyor, Quencher and Steam Exhauster, operating in Toronto, Canada, working in water-sealed flue, rollers being protected from heat and grit.

COAL CRUSHERS, CONVEYORS AND BINS. TURNTABLES FOR MACHINES.

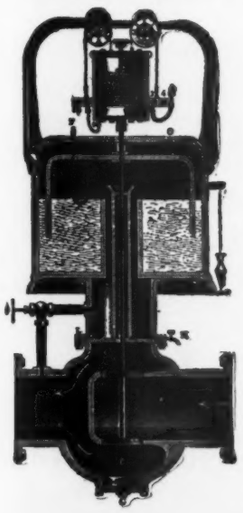
Labor-Saving Machines for Handling Coal and Coke from Coal Cars to Coke Yard or Bins, a Specialty.

G. A. BRONDER,

Contracting Engineer and Builder,

229 BROADWAY, NEW YORK.

CONNELLY IRON SPONGE AND GOVERNOR CO.,



Design, Construction and Extension of

COAL OR WATER GAS PLANTS,

Automatic, Balance, High Pressure and Service Governors,

Roots Improved Gas Exhausters,

Iron Sponge, Purifying Material for Gas Purification, Jones Jet Photometers, Pressure Registers, etc.,

INSTALLATION OF SMOKELESS TAR BURNING SYSTEM,

Reinforced Concrete Construction for all Purposes,

Wide Experience in High Pressure Installation and Extension,

GAS SPECIALTIES.

395 Broadway, NEW YORK.

295 West 22d Street, CHICAGO, ILLS.

PARKER-RUSSELL MINING AND MFG. CO.,

OF ST. LOUIS, MO.,

PROPRIETORS OF THE

OAK HILL GAS RETORT AND FIREBRICK WORKS.

ST. LOUIS OFFICE: 417 Pine Street. NEW YORK OFFICE: Aldrich Court, 45 Broadway.

WE MAKE A SPECIALTY OF WATER GAS LININGS AND CHECKER BRICK.

Half and Full Depth Benches of Our Own Design, Containing 6, 8 or 9 Retorts.

SLOPERS.—We have perfected plans of INCLINED RETORT BENCHES, designed to meet conditions prevailing in America, and constructed entirely of American materials.

We Build Benches Complete. Ready for Gas Making. Also,

RETORT HOUSES,

COAL and COKE CONVEYING MACHINERY.

Plans, Specifications and Estimates Cheerfully Furnished.

CORRESPONDENCE SOLICITED.

ALL CONTRACTS MADE AS OF ST. LOUIS, MO.

Gold Medals awarded by the Louisiana Purchase Exposition at St. Louis, for fireclay gas retorts, gas retort benches, firebrick and setting tiles.

Newbigging's Handbook for Gas Engineers and Managers. Price, $6.50. For Sale by A. M. Callender & Co., 42 Pine St., N. Y. City.

JAMES D. PERKINS, President. F. SEAVERNS, Treasurer.

THE PERKINS COMPANY,

228 and 229 Produce Exchange, New York City.

Ocean Mine Youghiogheny Gas Coal,
Old Kentucky Shale and O. K. Boghead.

SHIPMENTS FROM NEW YORK, PHILADELPHIA, BALTIMORE AND NORFOLK.

BERWIND-WHITE COAL MINING COMPANY'S

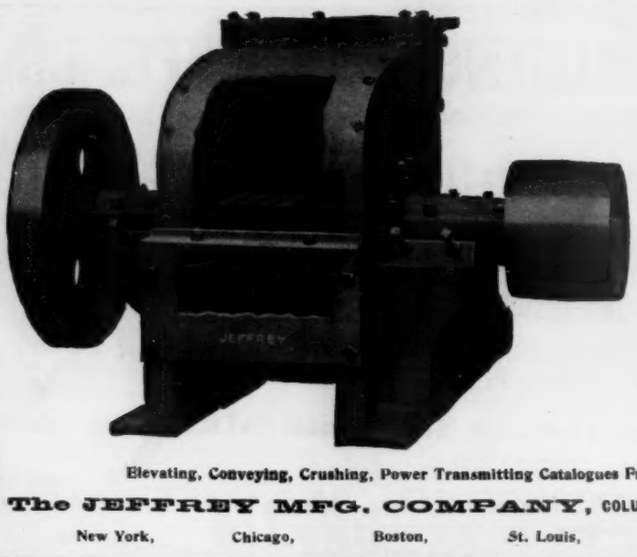
Ocean Westmoreland Gas Coal.

Offices:
Washington Building, New York.
Betz Building, Philadelphia.

STRICTLY High Grade. . . . .
Carefully Prepared.
For Gas Making or
Heavy Steaming.

A. C. M. AZOY, General Agent, 1 Broadway, New York.

JEFFREY SWING HAMMER CRUSHERS



Are INDORSED BY USERS in EVERY LOCALITY.

Fuel Gas Oxides and many classes of material treated.

Free Crushing Tests.

Correspondence Solicited.

Elevating, Conveying, Crushing, Power Transmitting Catalogues Free.

The JEFFREY MFG. COMPANY, COLUMBUS, OHIO, U.S.A.

New York, Chicago, Boston, St. Louis, Denver.

BINDER for the JOURNAL.

Price, $1.00.
A. M. CALLENDER & CO., 42 Pine Street, N. Y.

POOLE ON FUELS.

THE CALORIFIC POWER OF FUELS.
By HERMAN POOLE, F.C.S.

Second Edition. Price, $3. For Sale by
A. M. CALLENDER & CO., 42 PINE ST., N.Y. CITY

FRED. BREDEL, President. A. A. MOONEY, Vice-President, O. W. GREENSLADE, Secretary and Treasurer.

FRED. BREDEL COMPANY,
ENGINEERS AND BUILDERS OF GAS PLANTS.

Inclined Benches, own system, Recuperative Furnaces, Exhausters, Exhauster Governors, Condensers, Washers, Coolers, Wet Purifying Plants, Purifiers, Oxide Elevators, Hydraulic and Dry Coke Conveyors.

Special High Grade Material for Recuperative Furnaces.

Licensees for ARROLL-FOULIS Charging and Discharging Machines and FRONHAUSER Coke Conveyors. OFFICE, 405 KEENE ST., MILWAUKEE, WIS.

KELLER ADJUSTABLE COKE CRUSHER.

Strong, Simple, Durable. Will Crush any Size Desired.

C. M. KELLER,
Sec. & Supt. Gas Lt. & Coke Co.,
Columbus, Ind.
Correspondence Solicited.

BAXTER & YOUNG,

CONTRACTING AND CONSULTING GAS ENGINEERS.

Examination and Values Ascertained of Artificial and Natural Gas Properties.

COMPLETE GAS WORKS ERECTED.

Artificial and Natural Gas Mains Furnished and Laid.

GAS PROPERTIES PURCHASED.

OFFICE: WAYNE COUNTY BANK BUILDING,
Rooms 201 & 202. DETROIT, MICH.

Geo. Shepard Page's Sons.

GAS MACHINERY.

Correspondence Solicited.

180 Fulton Street, New York City.

DAVID LEAVITT HOUGH,

Consulting Engineer

AND

CONTRACTOR,

PARK ROW BUILDING, N. Y.

EDMUND H. McCULLOUGH, President. H. C. ADAMS, Vice-President. CHAS. F. GODSHALL, Treasurer. HENRY WHARTON, Secretary. C. B. NICHOLS, Assistant Secretary.

THE WESTMORELAND COAL CO.

Chartered 1854.

Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Pa.

POINTS OF SHIPMENT:

PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J., WATKINS (SENECA LAKE), N. Y.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas giving qualities, and in freedom from sulphur and other impurities.

Principal Office, 224 South 3d St., Phila., Pa.

SUN COMPANY,

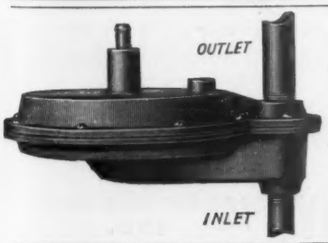
PRODUCER, REFINER, SHIPPER AND EXPORTER OF Petroleum and All Its Products.

Pittsburg, Pa., and Philadelphia, Pa.

THE SUN OIL CO.

Gas Oil, Gas Naphtha,
Refined Oil, Lubricating Oils.

Toledo, O., and Pittsburg, Pa.



REYNOLDS HIGH PRESSURE GAS GOVERNORS.

Our Governors Reduce 30 or 40 Pounds Pressure to 2 Inches Water Pressure.

WE MAKE ALL SIZES OF

DOUBLE DISTRICT GOVERNORS, INDIVIDUAL HOUSE SERVICE AND LOW PRESSURE GOVERNORS.

Write for Catalogue and State what you Need.

JOHNSON-REYNOLDS CO.,
ANDERSON, IND., U. S. A.

Standard Oil Company,

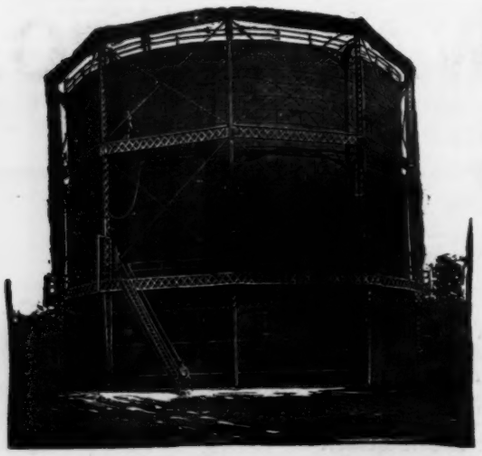
GAS NAPTHA DEPARTMENT.

GAS NAPTHA.

GAS OIL.

Correspondence Solicited.

26 Broadway, New York City.



DAVIS & FARNUM MFG. CO.,

Principal Office and Works, Waltham, Mass.

Single, Double and Triple-Lift Gasholders of any Capacity. Tubular, Pipe and Sinuous Friction Condensers of all Sizes.

Steel Tanks for Gasholders, Iron Roof Frames and Floors, Purifying Boxes, Center Seal or Valve Connections, Bench Work, Reversible Lime Trays.

Self-Sealing and Pressed Steel Mouthpiece Lids.

Coke Barrows, Coal Wagons, and all Apparatus Requisite for a Complete Gas Works.

Also, Gas and Water Pipe, Flanged Pipe, Sugar House Work, and Special Castings of all Descriptions.

KERR MURRAY MANUFACTURING COMPANY,

Engineers and Manufacturers

APPARATUS FOR COAL GAS PLANTS,

SINGLE AND DOUBLE-LIFT GASHOLDERS AND STEEL TANKS,

Latest Improved

ROTARY EXHAUSTERS, P. & A. TAR EXTRACTORS, AMMONIA WASHERS,

CONDENSING, SCRUBBING AND PURIFYING APPARATUS.

Street Specials and Valves.

ADDRESS:

KERR MURRAY MANUFACTURING COMPANY, {FORT WAYNE, IND.

THE GAS ENGINEER'S POCKET-BOOK,

By HENRY O'CONNOR,

Comprising Tables, Notes and Memoranda relating to the Manufacture, Distribution and Use of Coal Gas, and the Construction of Gas Works.

PRICE, $3.50.

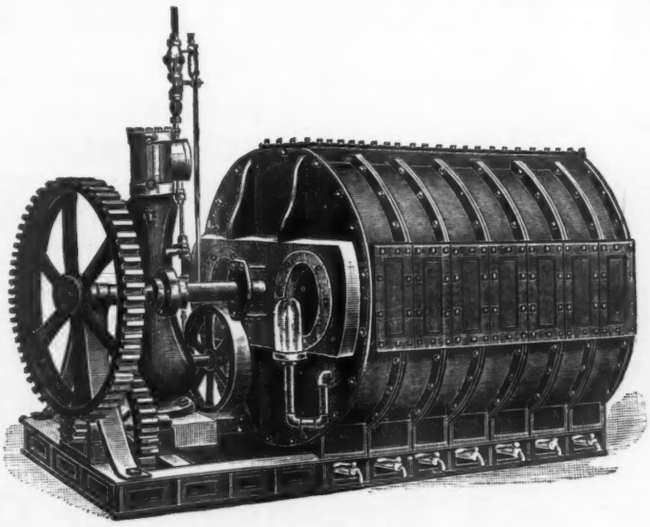
FOR SALE BY

A. M. CALLENDER & CO., - No. 42 Pine Street, New York City.

BARTLETT, HAYWARD & CO.

BALTIMORE, MD.

Designers and Builders of Gas Works.



Sole Lessees the Wilkinson Water Gas Process.

PATENT STANDARD WASHER-SCRUBBER.

The best apparatus for the extraction of all Ammonia and a large proportion of Carbonic Acid and Sulphureted Hydrogen. The Scrubber has been materially improved and is provided with patented Wooden Segmental Grids, instead of Metallic Disks, thus reducing the weight on shaft and power for operating same.

Coal and Water Gas Installations of the Most Modern and Complete Types.

BENCHES WITH INCLINED RETORTS.

System Stettiner Chamotte Fabrik, Actien Gesellschaft, of Stettin, Germany.

GASHOLDERS OF ALL SIZES.

General Western Agents, THE LLOYD CONSTRUCTION CO., of Detroit, Mich.

QUINTARD IRON WORKS,

N. F. PALMER,

Foot of 12th St. & East River, New York,

MANUFACTURERS OF

GAS APPARATUS.

Complete Works Erected.

FREDERICK W. FLOYD, Engineer.

ALEX. C. HUMPHREYS, M.E., M. Inst. C.E. ARTHUR G. GLASGOW, M.E., M. Inst. C.E.

HUMPHREYS & GLASGOW,

CONSULTING ENGINEERS.

BANK OF COMMERCE BLDG., 31 Nassau Street, New York.

38 VICTORIA STREET, London S.W., England.

ADVICE AS TO EXTENSION AND RECONSTRUCTION OF GAS AND ELECTRICITY PLANT.

COMPLETE EXAMINATIONS MADE. PROPERTIES PURCHASED.

R. D. WOOD & CO.,

400 CHESTNUT ST., PHILADELPHIA,

MANUFACTURERS OF

Cast Iron Pipe.

HEAVY LOAM CASTINGS,

Dunham Specials,

Hydraulic Work,

LAMP POSTS, VALVES, ETC.,

Gas Power Plants with Producers.

BUILDERS OF

Gasholders.

Single or Multiple Lifts, with or without Metal Tanks.

PURIFIERS, CONDENSERS, SCRUBBERS, BENCH WORK.

Cutler's Patent Freezing Preventer for Holder Cups.

J. S. DE HART, JR. President. R. K. WEHNER, Treasurer. A. F WEHNER, Secretary

ISBELL-PORTER CO.,

ENGINEERS AND CONTRACTORS FOR THE

Construction and Extension of Gas Works.

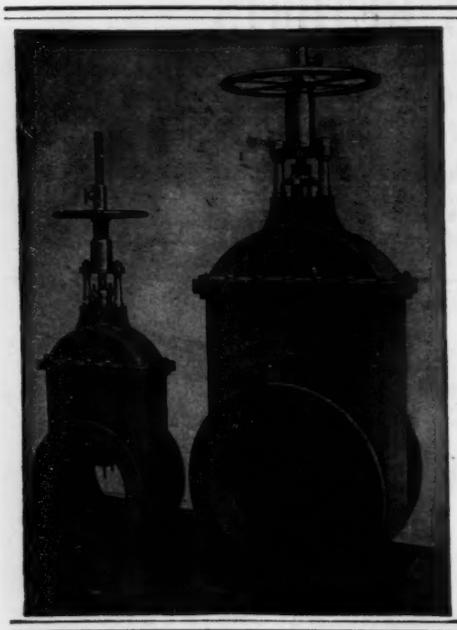
TOTAL ROTARY AMMONIA SCRUBBERS SOLD:

129,556,000 Cubic Feet Daily Capacity.

TOTAL WALKER TYPE TAR EXTRACTORS SOLD:

40,100,000 Cubic Feet Daily Capacity.

OFFICE AND WORKS: Bridge and Ogden Streets, Newark, N. J.



Double Gate Valves.

A LARGE STOCK ON HAND READY FOR PROMPT SHIPMENT.

These valves are provided with double discs or gates, and are tight with the gas pressure on either side of them.

The discs are so arranged as to be free from their seats when being opened or closed, and are operated by a quick-acting mechanism. The valve stem extends outside of the bonnet, and serves as an index, showing whether the valve is closed or open, and the amount of opening. They are made of the following dimensions:

Size.	8 Inches.	10 Inches.	12 Inches	16 Inches.	20 Inches.	24 Inches	30 Inches.	36 Inches.
Diameter of flanges.....	13 inches.	16 inches.	18 inches	22½ inches.	27 inches.	3 inches.	3 ½ inches	44 inches.
Face to face of flange...	12 inches.	12 inches.	12 inches	14 inches.	17 inches	20 inches	21 inches.	23½ inches.

For price and other information, apply to

THE CONTINENTAL IRON WORKS,

NEW YORK (BOROUGH OF BROOKLYN).

P. O. STATION G.

Directory of American Gas Companies, 1905.

Price, $5.00.

For Sale by

A. M. Callender & Co., 42 Pine St., N. Y.

THE STACEY MANUFACTURING COMPANY,

ENGINEERS FOR THE CONSTRUCTION OF COMPLETE GAS WORKS

GASHOLDERS AND STEEL TANKS

OF ANY SIZE AND DESCRIPTION,

And All Ironwork and Apparatus Required in a Gas Plant.

Also Oil Storage Tanks, Steel Roofs, Valves, Etc.

Makers of Apparatus for THE CHOLLAR PROCESS OF GAS PURIFICATION.

MAIN OFFICE AND WORKS, - - - Station P, Cincinnati, Ohio.
FOUNDRY AND CAST IRON WORKS, 239 Mill St., Cincinnati, Ohio.

RITER-CONLEY COMPANY,

GASHOLDERS, with or without Steel Tanks.

Purifiers, Condensers, Scrubbers, Oil Tanks, Smoke Stacks.

STEEL ROOFS and BUILDINGS.

PLATE AND STRUCTURAL WORK OF EVERY DESCRIPTION.

GENERAL OFFICE: Pittsburg, Pa. EASTERN OFFICE: 39-41 Cortlandt St., New York City.

WE DON'T CARE WHO MAKES YOUR METERS

If you use the Reeves slot attachments on them. Any good make of meter combined with the Reeves attachment makes the most perfect prepay meter ever manufactured.

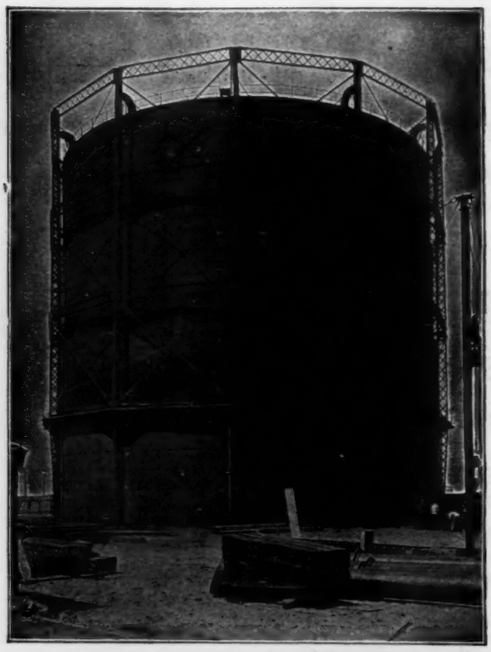
If your meter man does not handle the Reeves attachment we will supply you with the REEVES METER. Large capacity. Other important improvements. Unconditionally guaranteed.

REEVES MFG. CO., New Haven, Conn.

Newbigging's Handbook for Gas Engineers and Managers.

PRICE, $6.50.

A. M. CALLENDER & CO., 42 Pine Street, New York City.



Deily & Fowler,

39 Laurel Street, Philadelphia, Pa.

(ESTABLISHED 1842),

BUILDERS OF

GASHOLDERS,

Single-Lift or Telescopic,

With or Without Steel Tanks.

Oil Storage Tanks, Water Tanks, Etc.

ESTIMATES CHEERFULLY FURNISHED.

CORRESPONDENCE SOLICITED.

The order for this Triple-Lift Holder and Steel Tank was received by the Logan Iron Works from the Union Gas Light Company, of East New York. The contract was completed and the Holder was in actual use in 90 days from receipt of order. Capacity of Holder, 500,000 cu. ft.

LOGAN IRON WORKS,

Brooklyn, N. Y.,

MANUFACTURERS OF

Single or Multiple-Lift

GASHOLDERS,

Complete, with Steel Tanks.

BENCHES, SCRUBBERS,
CONDENSERS,
PURIFIERS, IRON ROOFS,

AND ALL PARTS OF

GAS WORKS APPARATUS.

Contractors for
Complete Works.

FREDERIC EGNER,
Gas Engineer,
NORFOLK, VA.,

May be consulted with reference to estimates of cost for new, or appraising actual value of existing works; utility of proposed or patented processes; relative earning power to capitalization, and management.

ELECTRIC GAS LIGHTING.

How to install electric gas igniting apparatus, including the jump spark and multiple systems for use in houses, churches, theaters, halls, schools, stores or any large building. Also, the care and selection of suitable batteries, wiring and repairs.

By H. S. NORRIE.

Price, 50 Cents. Orders may be sent to

A. M. CALLENDER & CO., - - - 42 PINE STREET, NEW YORK CITY.

Established 1854.

D. McDONALD & CO.,

MANUFACTURERS OF

WET AND DRY METERS, STATION METERS AND METER PROVERS.

ALSO MAKERS OF

THE GLOVER PREPAYMENT METER.

The amount of gas delivered for the coin can be instantly and positively changed without removing the meter or replacing any parts.

The gas registered agrees absolutely with the amount purchased by the coin.

WE HAVE MADE AND SOLD IN THE UNITED STATES

OVER 120,000 OF THESE METERS,

ALL OF WHICH ARE GIVING PERFECT SATISFACTION.

Correspondence Solicited.

561 West Forty-seventh Street, NEW YORK. | 51, 53 & 55 Lancaster Street, ALBANY, N. Y. | Jefferson and Monroe Streets, CHICAGO.

Westinghouse

Large Capacity or "A"

GAS METERS

Are the most economical meters to purchase.
They combine maximum capacity with minimum cost.
It would be to your advantage to write for catalogue and prices immediately.

We also Manufacture a Complete Line of

PREPAYMENT METERS
PROPORTIONAL METERS
WATER METERS
WATER AND GAS METER PROVERS

PITTSBURG METER COMPANY

EAST PITTSBURG, PA.

70 PER CENT.

Of Our Output is

PREPAYMENT GAS METERS.

We have fitted up over 16,000 Idle, Regular Meters with our

PREPAYMENT ATTACHMENT.

Can be attached to any make of meter.

NATHANIEL TUFTS METER COMPANY, 8 MEDFORD STREET, BOSTON, MASS.

MARYLAND METER CO.,

BALTIMORE, North and Saratoga Streets. **CHICAGO, 88 to 92 Jackson Boulevard.**

CONSUMERS' AND STATION METERS, PRESSURE GAUGES, ETC.

SPECIAL ATTENTION GIVEN TO ALL REPAIR WORK.

"Have you Seen our Complaint Meter?"

WHEN YOU SEND REPAIRS TO US

They can be changed to Prepayment, Prepayment and Beal Straight-reading, or Beal Straight-reading only. Good job. Good time. Good people. Write us.

KEYSTONE METER CO., Royersford, Pa.

New York Improved Meter Co.'s Regular and Prepayment Meters are the best.

306-308-310 EAST 47TH ST., NEW YORK CITY.

AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Wet and Dry Gas Meters, Station Meters, Meter Provers, Photometrical Apparatus, Gauges,

PREPAYMENT METERS,

REGULAR METERS REFITTED WITH PREPAYMENT ATTACHMENTS.

HELME & McILHENNY,

Established 1848. **1339 to 1349 Cherry Street, Philadelphia, Pa.**

MANUFACTURERS OF

Wet and Dry Gas Meters, Station Meters, Provers, Gauges, Etc.

METERS REPAIRED

PREPAYMENT GAS METERS.

Our Own Patents. Strong. Simple. PROMPT ATTENTION. CORRESPONDENCE SOLICITED.

METRIC METAL COMPANY,

MAKERS OF

GAS METERS for NATURAL and ARTIFICIAL GAS.

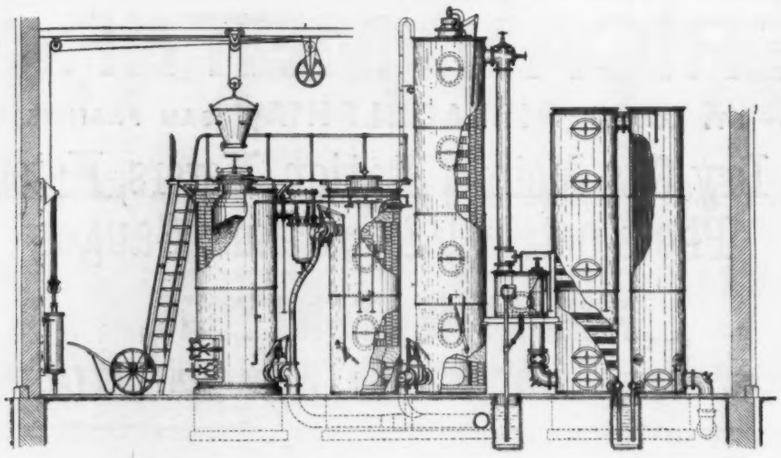
Special Attention given to Repairing METERS of all Makes.

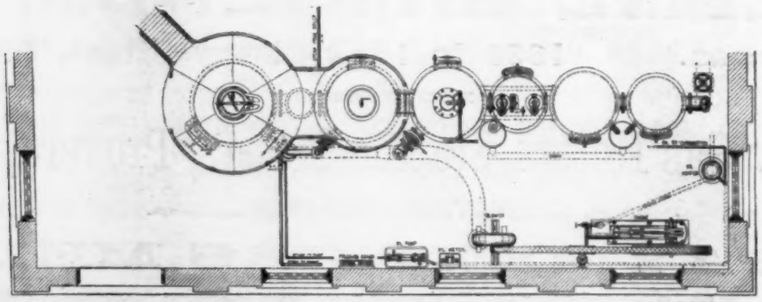
FACTORY AT ERIE, PA.

FOR SALE, NASH GAS ENGINE.

Fifty-horse power, 3-cylinder, latest type. Made by the National Meter Company. Engine can be run either on gas or gasoline. In use less than a year and as good as new. A desirable engine where natural gas is abundant and close regulation is not expected. For further particulars address

BUHL STAMPING CO., Detroit, Mich.





NO GAS COMPANY CAN AFFORD TO BE WITHOUT A

"WESTERN" WATER GAS SET

AS AN AUXILIARY TO ITS COAL GAS APPARATUS

NEVER TIED UP BY A

STRIKE

WE BUILD **THE BEST**

THE WESTERN GAS CONSTRUCTION CO.,

FORT WAYNE, IND.

NEW YORK, 1707 WALL ST. EXCHANGE BLDG.

SAN FRANCISCO, 410 MISSION ST.